telephony

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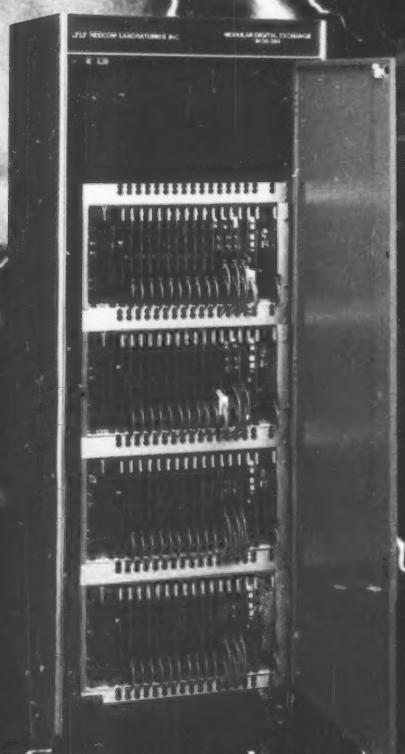

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January 7, 1985

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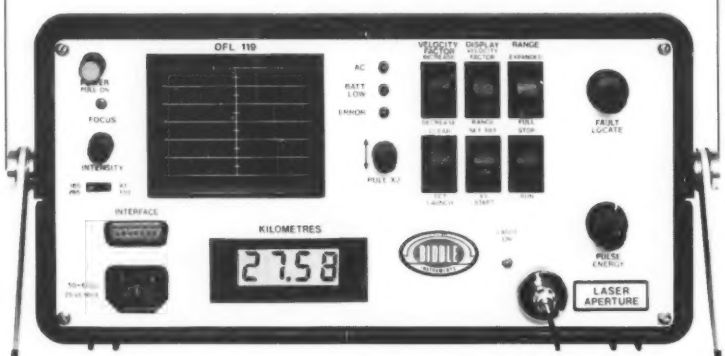

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January 7, 1985 Vol. 208

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MEETINGS

TELEPHONY's "Meetings" section provides chronological listings of telephone association and industry related meetings, giving date, state, site, hotel, plus an official convention information telephone number.

Telephone Association Meetings

Feb. 6-7, **New Hampshire,** Manchester, Sheraton-Wayfarer, 603/859-3770

Feb. 12-14, **USTA/USTSA Showcase,** New Orleans, New Orleans Expo Center, 312/332-1991

Feb. 13-15, **Louisiana,** New Orleans, Monteleone Hotel, 318/625-4009

March 10-13, **California-Western Rural,** Monterey, Calif., Doubletree Inn, 707/544-6863

March 17-20, **Minnesota,** Bloomington, Radisson South Hotel, 612/291-7311

April 15-18, **IntelExpo '85 U.S. Telecommunications Suppliers Assn. (USTSA),** Washington, Washington Convention Center, 312/782-8597

April 23-25, **South Carolina,** Charleston, Sheraton Hotel, 803/324-6027

May 6-8, **Alaska,** Fairbanks, Traveler's Inn, 907/563-4000

May 8-10, **Kentucky,** Lexington, Marriott Resort Inn, 606/273-2013

May 8-10, **Oregon,** Portland, Marriott Hotel, 503/581-7430

May 14-16, **Washington,** Pasco, Red Lion Inn, 206/352-5453

May 15-18, **Virginia,** Hot Springs, The Homestead, 804/643-0688

May 19-22, **Wisconsin,** Lake Geneva, Americana Resort, 608/231-2477

May 21-23, **USTA/USTSA Western Showcase,** Las Vegas, Nev., Convention Center, 312/332-1991

May 22-25, **Florida,** Palm Beach Gardens, PGA Sheraton, 904/877-5141

June 5-6, **Maine,** Rockland, Samoset Resort, 207/763-9911

June 9-12, **New York,** Grossinger, Grossinger's Hotel, 518/462-6696

June 16-18, **Illinois,** Springfield, Holiday Inn East, 217/525-1044

June 16-19, **Pennsylvania,** Hershey, Hotel Hershey, 717/238-8311

Industry Related Meetings

PTC (Pacific Telecommunications Council), Jan. 13-16, Sheraton Waikiki, Honolulu, 808/949-5752

2nd Annual BizTelCom-North-east Show, Jan. 16-18, The Aspen Hotel-Manor, Parsippany, N.J., 609/698-7020

13th Annual BICSI (Building Industry Consulting Service International) Conference, Jan. 22-24, Holiday Inn Airport, Tampa, Fla., 813/974-2403 or 813/224-4204

Communication Networks Conference & Exposition, Jan. 28-31, Washington, D.C. Convention Center, Washington, 617/879-0700

25th Annual Telephone Technicians Conference, Feb. 5-7, Sheraton Galleria, Bismarck, N.D., 701/671-2610

M/C Expo '85, National Mobile Communications Exposition and Conference, Feb. 12-14, Disneyland Convention Center, Anaheim, Calif., 213/826-6070

IEEE International Solid-State Circuits Conference, Feb. 13-15, New York Hilton, New York, 305/446-8193/4

Interface 85, March 4-7, Georgia World Congress, Atlanta, 617/449-6600

ISDN '85, the International Integrated Services Digital Networks Exposition, March 6-8, Casino Hotel, Atlantic City, N.J., 617/787-1776

Tele-Communications Assn.'s Tele-Communications Northwest Teleconference, March 17-19, Westin Hotel, Seattle, 206/522-3100

Comtel '85, International Computer and Telecommunications Conference, March 18-20, Infomart, Dallas, 214/631-6482

IEEE Infocom '85, Computers and Communications Integration, March 25-28, Hyatt Regency, Arlington, Va., 301/589-8142

Teleconferencing '85, May 13-16, Center for Interactive Programs, University of Wisconsin-Extension, Madison, Wis., 608/262-2569

NOTICE

The New York State Thruway Authority invites proposals for the nonexclusive utilization of its right-of-way for underground communications facilities. These proposals may only be made by principals or those acting on behalf of designated principals.

The right-of-way available for this use will be the Thruway Mainline from New York City to the Pennsylvania State Line, the Garden State Parkway connection from Mainline Interchange 14A (MP 23.5) to the New Jersey State Line, the New England Thruway from New York City to the Connecticut State Line, all of the Berkshire Section which extends from Selkirk (Mainline Interchange 21A - MP 133.6) to the Massachusetts State Line and the Niagara Section from Cheektowaga (Mainline Interchange 53 - MP 426.2) through the City of Buffalo to Niagara Falls. Once installed, access to the facility, wherever possible, will be made from local roads or privately acquired easements through vendor constructed access gates.

Proposals must be received by March 4, 1985, and should include the limits of the occupancy requested, an estimate of the area needed for cable and accessory installations, duration of the occupancy and the fee offered. The Authority will consider either monetary compensation or a combination of monetary compensation and capacity for use by the Authority and the State of New York. Based on its evaluation of the proposals received, the Authority will announce a determination by May 3, 1985.

The proposal and any questions concerning the foregoing should be directed to the Authority's Chief Engineer at P. O. Box 189, Albany, New York 12201. Phone inquiries may be made to (518) 449-1750, extension 371.

Alexander A. Levine
Executive Director

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3	Material and (W) service engineer leave for Hinesville.
4	Mainland installation completed.
5	Island installation completed and tested.
6	First subscriber in service.

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Power Carrier Line

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Illinois Bell adds RSS in Kaneville

Illinois Bell has installed a Remote Switching System (RSS) in Kaneville, Ill., which replaces an old mechanical switching system.

"We have other Remote Switching Systems in operation around the state," Bruce DeMaeyer, Illinois Bell vice president-operations, said, "but Kaneville is the first one to be controlled by a 5ESS computerized digital switching system. The 5ESS is located 6 miles away in Sugar Grove."

Kaneville customers will be able to place person-to-person and collect calls as easily as direct-dialed calls. The system also lets customers place Calling Card calls without operator assistance and eliminates the need to dial a 1 when making calls outside their free calling area in the 312 area code, which includes the entire Chicago area.

Rolm, Wang pursue equipment compatibility

Rolm Canada Inc. and Wang Laboratories, Inc. have agreed to work together to pursue compatibility of the Rolm CBX II business communications system and Wang office automation products.

According to the agreement Rolm and Wang will test to confirm the interconnectivity of current equipment. As a further step, the two companies plan to define and test additional methods of connectivity and compatibility between Wang computers and the Rolm CBX II.

Rolm Canada is located in Willowdale, Ontario. Wang Laboratories is headquartered in Lowell, Mass.

GTE Sprint begins advanced digital service

GTE Sprint Communications Corp. has placed in service a nationwide satellite network utilizing digital technology for long distance telephone communications.

The coast-to-coast satellite earth station network is capable of carrying regular telephone calls, television signals and data. Traffic is relayed through the transponders on Spacenet I, a satellite which uses both the C-band and Ku-band radio frequencies. The earth stations process and transmit signals to and from the GTE Spacenet I satellite and will also use the Spacenet II satellite.

GTE Sprint Communications Corp. is based in Burlingame, Calif.

Contel finalizes subsidiary realignment

Continental Telecom Inc. (Contel) is nearing completion of internal realignment of several subsidiaries in an effort to facili-

Continued on page 76

NEWS OF THE WEEK

Access fee decision sparks mixed reaction

VICTOR BLOCK
Washington Editor

The unanimous action by the Federal Communications Commission (FCC) adopting the joint board-proposed access charge plan for residential and single-line business customers set off an immediate mixed reaction.

While many consumer spokesmen protested the commission's move, it received words of both support and criticism in Congress—along with pledges ranging from a promise of close scrutiny of access charge effects to legislation intended to offset what are seen as negative effects of the decision.

In a dramatic display of the extent to which telecommunications cost issues have come to the attention of the public,

Continued on page 20

Jartran, Inc., the truck rental firm, has signed an agreement covering the purchase and installation of stored program key systems from Inter-Tel, Inc. The equipment will be installed in 10 Jartran regional offices. Pictured at the contract signing are (l-r, seated): Valerie Friedman, manager of telecommunications, Jartran; Thomas Bezold, vice president of finance, Jartran; Matt Mihaylo, senior vice president-sales and marketing, Inter-Tel; (l-r, standing) Bill Serda, vice president-human resources, Jartran; Dennis Maher, director of management information systems, Jartran; and Joe Cortney, central region vice president, Inter-Tel.

VICTOR BLOCK, Washington Editor

USOA proposal expected to spur controversy

The Federal Communications Commission (FCC) has spelled out proposed changes in the uniform system of accounts (USOA) that has brought an immediate negative reaction from some telephone industry sources. The U.S. Telephone Assn. (USTA) moved quickly to object to the cost and timing of the commission's rulemaking notice, while the regional holding companies of former Bell operating carriers provided a sizable estimate of the cost of conversion to the new accounting system.

The FCC (CC Docket 78-196) called for comments on proposals, based upon a report by the Telecommunications Industry Advisory Group, for a new accounting system for Class A and B telcos subject to commission jurisdiction. This would rescind Part 31 of its rules (USOA for Class A and B telcos) and Part 33 (USOA for Class C telcos), replacing them with a single USOA for all subject telephone companies (Part 32).

Part 32 would divide carriers into two classes: Class A, with annual gross operating revenues of $100 million or more, and Class B, with revenues below that level. The new USOA would:

- Disaggregate plant accounts from the current 20 broad categories to 41 "technology-specific accounts." These would be grouped under switching, transmission, information origination/terminal (such as terminal equipment), support (such as buildings and vehicles) and other functions, as well as an intangibles account for such factors as patents and rights-of-way;
- Revamp expense accounts into plant, customer and corporate operations categories, with specific accounts reflecting the activities that people perform;
- Expand revenue accounts from what the FCC said are "a handful of non-specific service designations" to market-specific categories encompassing private network, public network, access, customer premises facilities, and miscellaneous service revenues allocated to specific products and services; and
- Change the account numbering scheme to four digits, and the order of accounts to conform with that which the commission said is more generally used for financial reporting.

The commission also has proposed what it terms a two-dimensional matrix concept to classify expenses, with every expense characterized by purpose and type.

The "purpose" essentially equates an expense to its functional nature (such as plant operations) while the "type" identifies the "objective" nature of expenses (such as wages, salaries and benefits). Under the matrix concept, every expense will be classified by both its purpose and type.

The FCC has proposed two alternative approaches to implementing the new USOA. Under a flashcut approach it would be fully implemented by Jan. 1, 1987, with full annual reporting to the commission by March 1, 1988. A phase-in alternative would call for implementation over a specified time period, beginning possibly in 1986.

The FCC said a new USOA is needed because the accounting system adopted in 1935 is inappropriate in today's complex and competitive technological and economic environment.

The FCC also said the current system is called for to keep pace with changes in the telecommunications industry and to maintain commission responsibility to regulate carrier rates in the public interest.

The commission is seeking comments on ways to reduce the costs of implementing the new system. It asked for cost estimates identified with specific proposals. Comments will be due 60 days after the FCC formally issues the text of its rulemaking notice, with replies due 30 days after that.

Not waiting for formal submission of views, the regional holding companies have estimated a total cost to them of $585 million to switch to the proposed USOA. USTA, in a statement provided to the press at the time of the FCC briefing on its proposal, set an industry cost estimate of $900 million, and said that cost far outweighs any benefits of the changes. Noting that the proposals were for the most part drafted prior to the American Telephone & Telegraph Co. divestiture, USTA said costs of customer access will have to be passed along to ratepayers. USTA, among other complaints, also claimed it is too soon after divestiture to institute such far-reaching changes in accounting, with telephone companies still "caught up in the new world of competition, bypass and access."

FCC clears itself as cost increase factor

In a further report on the effects of its decisions upon local telephone service, the Federal Communications Commission (FCC) has largely absolved itself of responsibility for any large increases in rates or costs borne by residential users. The latest report, which the commission said includes input absent from an earlier study, concludes that residential and small business telephone customers are unlikely to suffer adverse impact from FCC decisions.

The commission in December 1983, responding to a petition by the State of Michigan, issued a report on the cumulative effects of FCC actions and the American Telephone & Telegraph Co. divestiture on the availability of and charges for local telephone service. That study concluded among other things that the bulk of revenue requests by exchange telephone companies were linked to factors other than federal decisions, that actions by the commission will not cause sharply higher minimum charges for residential service and that there is no evidence that federal actions will threaten universal telephone service.

Following release of this report, the FCC has solicited additional information and comments on its study (CC Dockets 83-788, 78-72 Phase IV) which it said were intended to provide a more comprehensive record for further review. Based on the latest comments and new information, the FCC has reiterated its initial findings. The commission said it continues to believe that its decisions taken together—and those relating to access charges in particular—do not threaten universal service. It said there is no "persuasive evidence" of suffering by residential or small business customers as a result of commission decisions, and that it has concluded its resources should be focused on monitoring universal service rather than "modeling or predicting the future."

FCC readopts COMSAT 'authorized user' policy

Acting in accordance with a court remand, the Federal Communications Commission (FCC) has readopted a policy—originally adopted in 1982 and vacated by the court early in 1984—allowing the Communications Satellite Corp. (COMSAT) to deal directly with end users (CC Docket 80-170). The "authorized user II" policy replaces a policy adopted in 1966 ("authorized user I") that had restricted COMSAT generally to serving as a "carrier's carrier."

The FCC's 1982 action directed COMSAT to lease satellite circuits directly to

Continued on page 16

FORGING A GLOBAL TELECOMMUNICATIONS STRATEGY

A NATIONAL POLICY CONFERENCE

PROGRAM

Monday, February 25
Keynote Speaker: (Dinner Banquet): Meeting the Global Needs, Creating Global Market

Tuesday, February 26
Keynote Speaker: *Managing the U.S. Telecommunications Growth*

Morning Session: Network Growth and Spectrum Policy

Luncheon Panel: Improving Competitiveness of the U.S. Telecom Industry

Afternoon Session: Industrial Nations: Partners and Competitors in High-Tech

Wednesday, February 27
Morning Session: Developing Telecom Potential in the Non-Industrial World

Luncheon Panel: Prospects for Global Telecom Development

MAIN SPEAKERS

Charles Brown, Chairman of the Board, AT&T
Sir Donald Maitland, Chairman, Maitland Commission
Mark Fowler, Chairman, FCC
Richard Parlow, Associate Administrator, NTIA
Lionel Olmer, Under Secretary for International Trade, Commerce Dept.
Jack McDonnell, Vice President, Electronic Industry Association
Joe Alper, President, World Systems Division, COMSAT
Richard Stern, Chief, Telecom Division, World Bank
Ambassador Diana Lady Dougan, U. S. Department of State
Stuart Meister, General Counsel, American Satellite

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Continued from page 14

end users on the same terms and conditions available to authorized service carriers. It also allowed COMSAT, through a separate subsidiary, to seek authorization as a common carrier to provide end-to-end switched and leased channel services.

A federal appeals court last January vacated and remanded the commission's order. The court said the FCC had abused its discretion by not considering issues before it related to direct carrier access to International Telecommunications Satellite Organization (INTELSAT) space segment (CC Docket 82-548) and independent ownership of earth stations (CC Docket 82-540) prior to implementing the revised user policy.

Subsequently, the FCC adopted a report and order denying proposals to change arrangements under which carriers would acquire INTELSAT satellite capacity used in providing services and terminated the Docket 82-548 proceeding (TELEPHONY, April 23, 1984, p. 21). The commission also has adopted a proposal for independent ownership of earth stations (TELEPHONY, Dec. 17, 1984, p. 16).

The policy readopted by the FCC allows COMSAT to expand its public operations in two ways. COMSAT's World Systems Div. will lease space segment directly to users including enhanced-service providers at U.S. international earth stations, and COMSAT is permitted through a separate subsidiary to offer end-to-end services. Service carriers also will be allowed, if they wish, to "decomposite" their leased-channel rates so they may charge separate rates for cable-based and satellite-based services.

The FCC said it continues to believe that the public interest will be served by requiring COMSAT to lease space segment directly to users and enhanced-service providers and permitting a common carrier subsidiary to provide earth station and end-to-end services. The commission said this policy will give users increased choice and put competitive pressures on rates for leased channel and exchange services.

FCC sees diversion of WATS, long distance

The Federal Communications Commission has adopted a report by its Common Carrier Bureau which projects possible diversion from the public switched telephone network of virtually all wide area telecommunications service (WATS) traffic and an indeterminate amount of ordinary long distance calls. The study (CC Docket 78-72) includes this outlook among conclusions about bypass of the public switched system.

The current report goes beyond an earlier one released in February 1983 because that study was limited to privately provided bypass systems, while the current study includes the impact of private line services, and the latest report took into account data and comments obtained in response to a public notice, unlike the first report.

Among conclusions of the current study are that:

- Bypass will continue to grow, fueled by such factors as "the high costs of using the public switched network," decreasing technology charges and new communications needs;
- During the next few years, service bypass (such as the use of private lines) will be the most prevalent form of bypass;
- The most likely source of service bypass growth in the near future is establishment of direct links between long distance carriers and points with large concentrations of traffic; and
- Direct links between interexchange carriers, particularly American Telephone & Telegraph Co. (AT&T), and large customers "may divert virtually all WATS traffic and an indeterminate amount of ordinary long distance calls from the public switched network. Carriers competing with AT&T already offer 'WATS-like' services that avoid switched access charges, and AT&T is taking actions that will enable it to do so also."

Private satellites get FCC attention

The Federal Communications Commission (FCC) is wasting little time in acting

Continued on page 78

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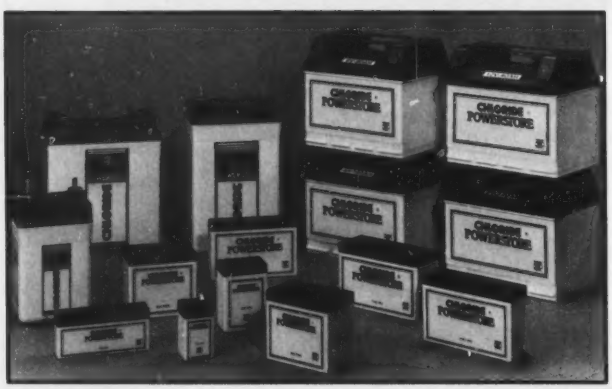

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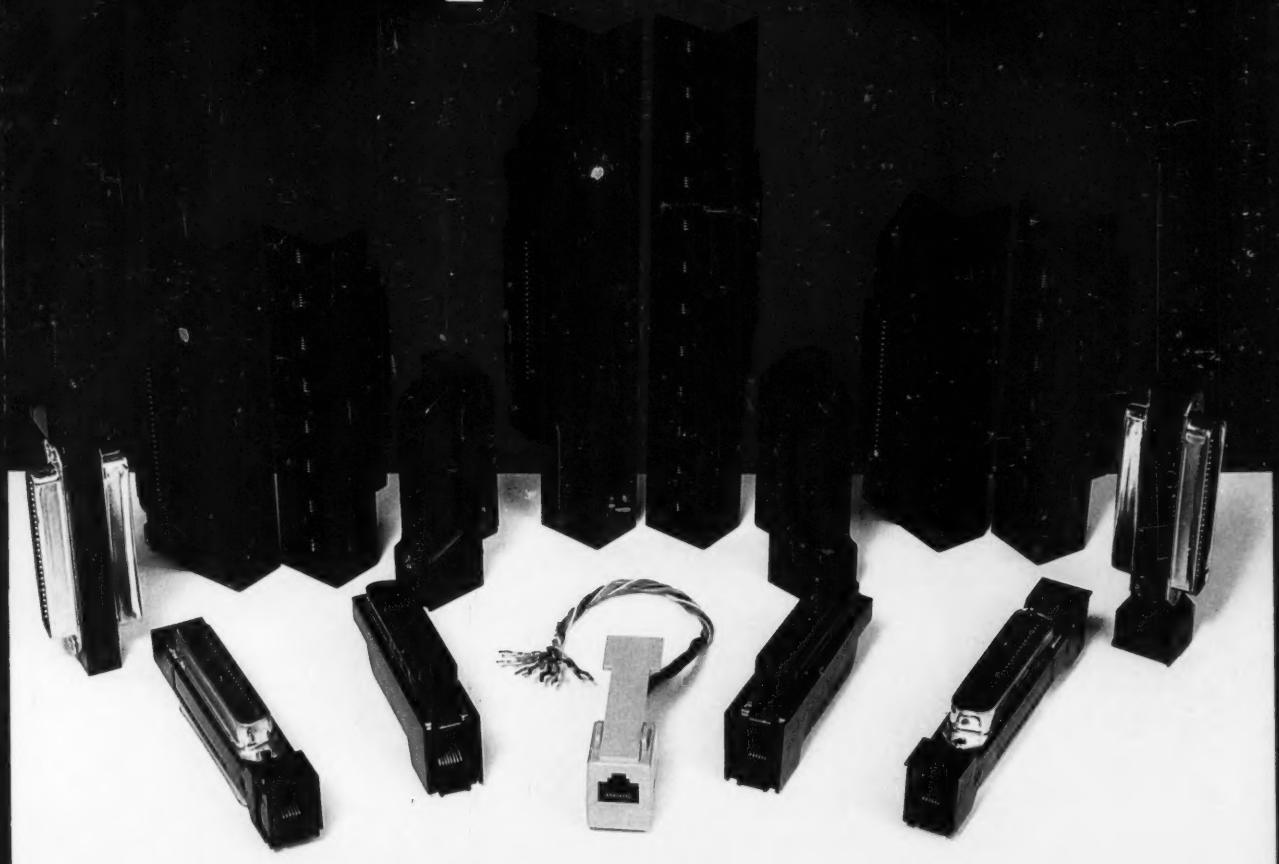

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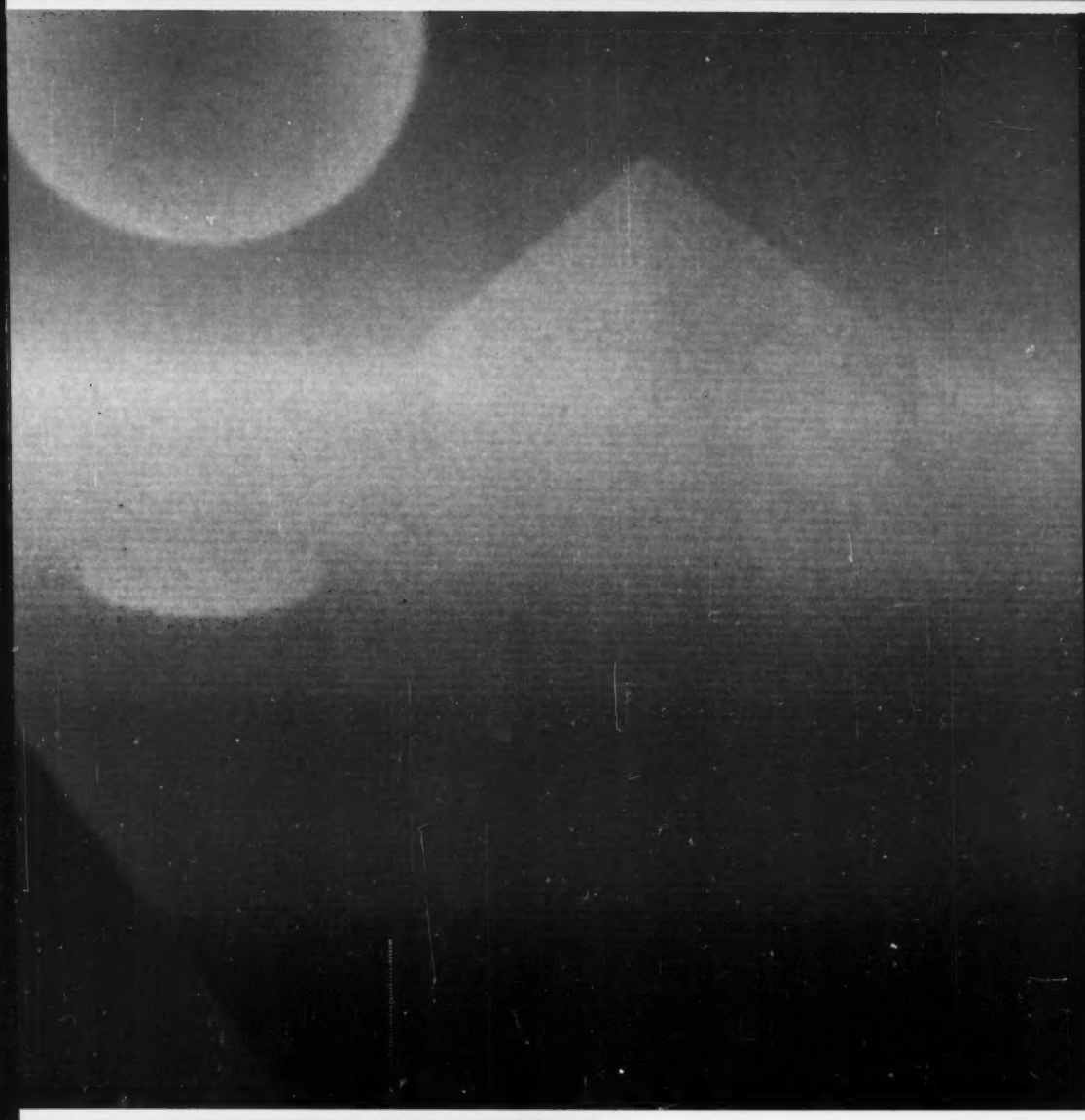

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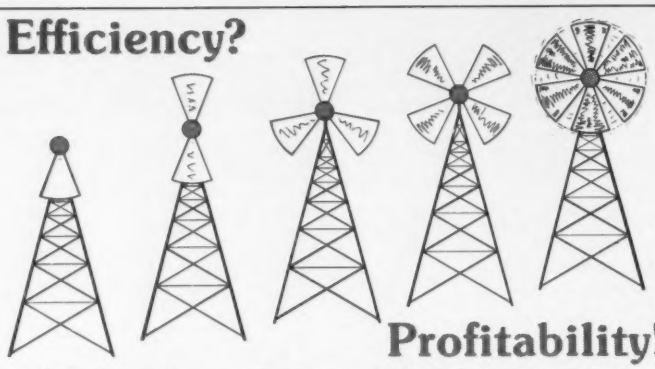

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Continued from page 13

the FCC action sparked a protest at the commission's Washington headquarters building. As FCC members and staff discussed and deliberated the access charge decision, representatives of consumer organizations carrying signs of protest marched in front of the building, swarmed into the hallways and briefly entered the meeting room itself, and placed a giant size telephone on the sidewalk to represent what they charged are current inflated costs of telephone service.

The FCC in adopting the joint board recommendations (TELEPHONY, Nov. 26, 1984, p. 13) went out of its way to hold out at least a verbal olive branch to lawmakers and others fearful of the adverse impact on universal service and the availability of basic telephone service among low income subscribers. Commission Chairman Mark S. Fowler said that unless the FCC had acted as it did, local rates would be "higher—much higher." He added that consumers will benefit from reductions in long distance rates that will match the access charges "dollar for dollar."

The joint board recommendations adopted by the FCC (CC Dockets 78-72, 80-286) are to:

- Implement a $1 monthly subscriber line charge for residential and single line business customers effective June 1985, increased to $2 per month in June 1986 and frozen at that level;
- Give local telephone companies, with state regulatory or joint board concurrence, flexibility to implement optional alternative interstate tariff provisions for recovery of carrier common line costs in an effort to combat localized bypass problems;
- Provide for a uniform monthly surcharge up to 35¢ on the subscriber line charge for customers in a study area. This is intended to provide for recovery of revenue shortfall to the extent that the tariff provisions fail to generate the same revenue levels as application of the nationwide average carrier common line charge;
- Modify provisions for high-cost assistance to change the high cost formula to increase the assistance level for telephone companies with fewer than 50,000 working loops; use the authorized interstate rate of return for access service (currently 12.75%) in calculating the level of high cost assistance; freeze study area boundaries as they existed on Nov. 15, 1984, for separation purposes, and continue to allocate non-traffic sensitive category 6 central office equipment on the basis of the subscriber plant factor pending further study and to exclude it from consideration in calculating the level of high-cost assistance; and
- Establish an optional program—intended to offset the effect of line charge on low income subscribers—for a 50% reduction in the charge for customers meeting a verifiable state-established "means test," with the resulting revenue shortfall recovered through interstate carrier common line charges.

The FCC endorsed joint board recom-

Continued on page 22

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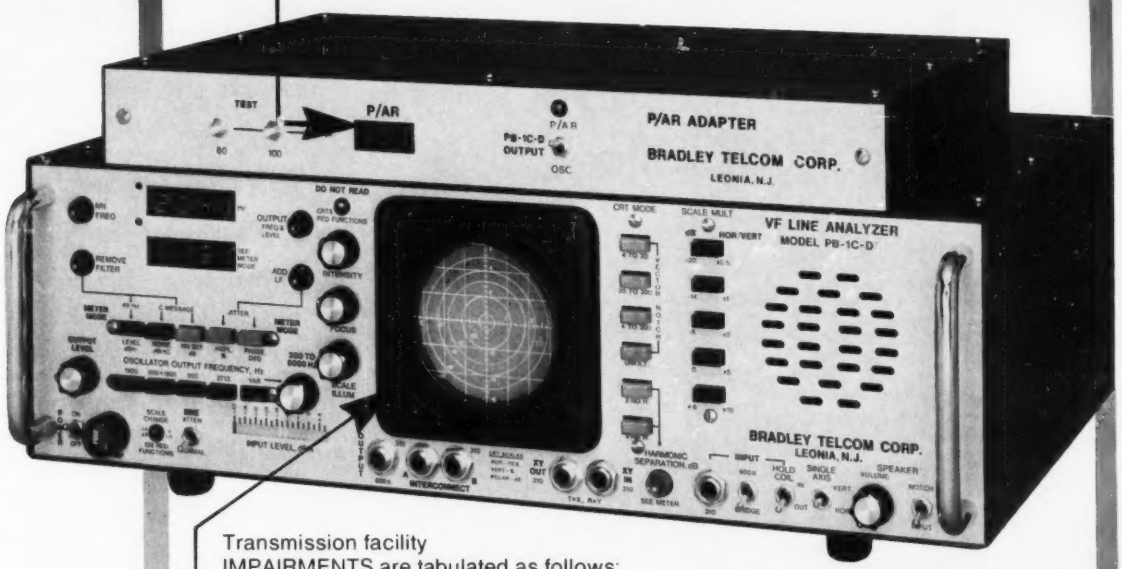

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Continued from page 20
mendations for an expedited study of additional "lifeline" assistance measures, directing the board to begin work by the end of next March and present its recommendations within 180 days, and calling on the Common Carrier Bureau to seek additional comments on the effect of subscriber line charges on small business subscribers. The commission said it will issue a notice late in 1986 to institute a further joint board proceeding to examine the effect of subscriber line charges and alternative anti-bypass tariffs on universal service, bypass, economic efficiency and interexchange competition.

The FCC's action received provisional backing from Rep. Timothy E. Wirth (D., Colo.), chairman of the House telecommunications subcommittee. Taking note of the $2 cap on access charges, he said this represents a "major rollback" from the original plan put forth by the commission. Wirth added, however, that any move to boost the charge over $2 could jeopardize the "delicate balance" of fixed cost sharing between local and long distance carriers and, he cautioned, "will be carefully scrutinized by Congress."

Wirth also voiced disappointment with FCC treatment of "lifeline" concerns solely through waiver of the subscriber line charge. Noting that the commission "has established a process to devise a lifeline plan that goes beyond a simple waiver," he said his subcommittee will follow the process closely.

A more active reaction to the FCC's order is being readied by another legislator. Rep. Mickey Leland (D., Texas) is preparing to introduce in the next Congress lifeline provisions of a universal telephone service bill that was passed by the House in its last session. The measure would establish a "lifeline service fund," comprised of uniform surcharges imposed on interstate toll service, used to refund to carriers 50% of the difference between regular residential service rates and "lifeline" charges.

Leland and six other House telecommunications panel members have complained to Fowler in a letter that the joint board recommendations that have been adopted by the FCC "fail to fully address the needs of the poor." While saying the plan does appear to deal adequately with concerns about service to rural areas, they said it is not sufficient to meet the needs of the poor "in light of increasing local rates and access charges."

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Continued from page 22

wire, an increase in capacity of 112%, according to the telco. Pacific Bell is installing other systems in San Ysidro, Grass Valley and Simi Valley. The Grass Valley system will be the first DMS-1 U to use fiber optic cable, the telco said.

COMSAT General retires COMSTAR D-1 satellite

COMSAT General Corp. has removed the COMSTAR D-1 from geosynchronous orbit after 8½ years of performance. The satellite was the first used by American Telephone & Telegraph Co. (AT&T) for domestic public switched message traffic in the United States. It also was the first of the satellites in the four-satellite COMSTAR system.

The entire communications capacity of the four satellites in the system was leased to AT&T under a long-term agreement. The D-1 satellite was launched on May 13, 1976. It has been retired because it lacked sufficient station-keeping fuel to keep it in orbit. The D-3 satellite will assume the orbit slot used by D-1, with the D-2 satellite acting as an in-orbit spare.

COMSAT General is a wholly owned subsidiary of Communications Satellite Corp. (COMSAT), Washington.

ITT-BCC inks deal with Hitachi America

ITT Business Communications Corp. (ITT-BCC) will distribute in the United States and Puerto Rico the Hitachi DX series of digital PBX (private branch exchange) systems manufactured by Hitachi America, Ltd.

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Integrated Voice Data Networks: LADT, CSDC and ISDN is the topic of a 2-day seminar to be held Jan. 14-15 in Washington; sponsored by TeleStrategies, Inc., McLean, Va.; telephone: (703) 734-7050.

A 2-day conference on **Multi-tenant Telecommunications** will be offered Jan.

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17-18 in San Antonio, Texas; sponsored by Office Telephone Management, San Antonio; telephone: (512) 229-9019.

A-C Drives Maintenance Training is a 4-day course being offered on three dates beginning Jan. 21-24 in Atlanta; sponsored by Reliance Electric Co., Cleveland, Ohio; telephone: (216) 266-6000.

A 2-day seminar on **Negotiating Telecommunications Contracts: Business & Legal Aspects** will be offered Jan. 22-23 in New York; sponsored by Legal Times and Telematics, Law & Business, Inc./Harcourt Brace Jovanovich, Publishers, Clifton, N.J.; telephone: 1-800-223-0231; in New Jersey (201) 472-7400.

A 3-day seminar evaluating **Local Area Networks** will be offered on a variety of dates in several cities, beginning Jan. 23-25 in Phoenix, Ariz.; sponsored by Center for Advanced Professional Education, Santa Ana, Calif.; telephone: (714) 261-0240.

Reducing Telecommunications Cost Using Distributed Networks is the title of a 3-day course to be offered Jan. 23-25 in Washington; sponsored by George Washington University, Washington; telephone: 1-800-424-9773; in Washington (202) 676-8523.

Local Area Communications will be the topic of a 2-day conference to be held Jan. 24-25 in Ft. Lauderdale, Fla.; sponsored by Gartner Group, Stamford, Conn.; telephone: (203) 964-0096.

Teleconferencing in Business: Applications and Strategies is the subject of a 4-day conference Jan. 27-30 in Tucson, Ariz.; sponsored by the Center for Interactive Programs, University of Wisconsin, Madison; telephone: (608) 262-4554.

Finding Telecommunications Information is the title of a 2-day seminar to be held Jan. 28-29 in Burlingame, Calif.; sponsored by Phillips Publishing, Inc., Bethesda, Md.; telephone: (301) 986-0666.

A 2-day seminar entitled **Simplifying Communications Wiring** will be offered on a series of dates in different cities beginning Jan. 29-30 in Boxboro, Mass.; sponsored by Darlabs, Inc., Harvard, Mass.; telephone: (617) 456-3500.

Brindlee Mountain Telephone Co., Arab, Ala., recently began using a Satellite Business Systems (SBS) satellite earth station to offer long distance telephone service (TELEPHONY, Nov. 19, 1984, p. 126). Shown at the dedication for the earth station are Stephen B. Schwartz (l), then SBS president; and Sid McDonald, president of Brindlee Mountain Telephone. Schwartz is now Assistant Group Executive for the Telecommunications Products Organization in the Information Systems and Communications Group at International Business Machines Corp. (TELEPHONY, Dec. 17, 1984, p. 17).

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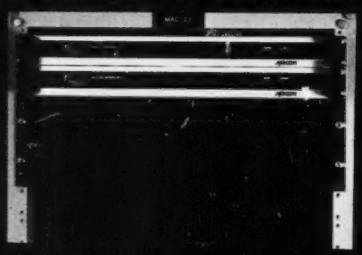

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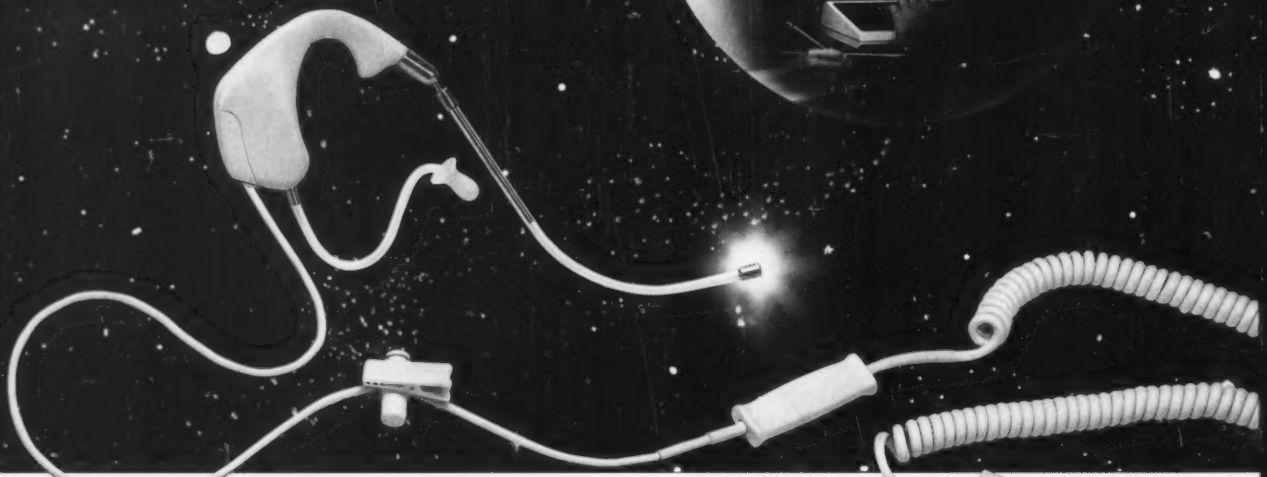

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AS WE SEE IT

How to deal with bypass

EVERY telephone company is worried about bypass, wherein a major customer sets up his own system to connect with the long distance network rather than use the local telco's facilities. The threat is real. The question is how best to deal with it. We came across some pretty good suggestions in that regard in an article in the November issue of *Intercom*, Alltel Corp.'s company publication. The article gave a detailed account of what bypass is, how much it could cost, and what regulatory and legislative actions can be taken in regard to it. Finally, it described three tools telcos can use now to deal with bypass. Here is the conclusion of the article:

"Bypass systems are an attractive mistress capable of luring business customers away with promises of lower telephone bills, but there's another side to the story. What many customers fail to realize is that if they own their own telephone network, they are responsible for maintaining it. That means if their lines or equipment need repair they can no longer count on the telephone company to fix it.

"Another aspect of bypass that business customers don't realize is that because technology advances so rapidly, the system they buy may become obsolete in just a few years. That means they may have to make costly modifications or buy another new system. For businesses that is a substantial risk.

"Second, if the customer is still considering bypass, Alltel plans to offer an enhanced business service that would serve customers as an alternative to bypass.

"If the company still decides to construct its own bypass system, Alltel can make the best of the situation by offering its engineering and maintenance services and help the customer construct their own bypass system. In this way, we can continue to supply our customers with telecommunications service to offset any losses in toll revenues.

"The success with which we can do these things will determine, in part our success in this new, technologically sophisticated era of telecommunications."

As we see it, those "tools" should be put to use by all telephone companies. □

Automation and its effect on telco operations

United Telephone System photo

Judy Summers, network systems support coordinator at United Telephone Co. of Florida, loads information into a database used for forecasting equipment needs and analyzing network problems.

KAREN A. KREPPS

WHAT IS the single most dominant influence on the telecommunications business today? Competition? New transmission technologies? Customer needs? Computers?

Probably computers. Whether as digital switches, large mainframes, office systems or personal computers (PCs), computers have dramatically changed the way of providing telephone service.

The United States has moved from the industrial age to the information age. In fact, experts have projected that by the end of the century, 80% of the American work force will depend on data processing to do their jobs.

In telecommunications, computer dependence may be higher than in any other service industry. Seven of the world's largest telecommunications services providers are the regional Bell operating companies (RBOCs). As a group they have ". . .well over 3000 minicomputers and 300 mainframe computers in use," said Irwin Dorros, executive vice president, technical services, for Bell Communications Research, Livingston, N.J. "Many of these computers are used to provide planning, engineering, maintenance and administrative systems for their networks. These systems are part of the core technology of the telephone plant. The RBOCs literally couldn't run their networks without them."

THE AUTHOR
Karen A. Krepps is Staff Director-Operations Planning at United Telephone System, Inc., Overland Park, Kan.

United Telephone System (UTS) is part of the computer revolution. Digital switches will serve 70% of its access lines by 1989. Also, in fewer than 4 years, UTS' four large mainframe computers at the regional data centers have experienced phenomenal growth. From 1981 through present projections for 1984, there has been a 364% increase in monthly batch jobs; a 322% increase in monthly on-line transactions and a 377% jump in terminals accessing mainframes. These numbers still do not reflect the entire picture, since there are hundreds of applications running on the many smaller mainframes in individual UTS operating companies. Nor has usage been quantified on the ever increasing number of personal computers (PCs) in use throughout the system. However, an article in the Jan. 23, 1984, issue of Fortune magazine documented that meteoric rise of the personal computer and projected 80 million devices will be installed by 1987 and that 75% of this processing power will be in businesses.

Applications

What kinds of applications are running on all these computers?

As with most telephone companies, UTS has numerous accounting and financial systems which handle payroll, personnel and the complex financial information required of a public utility. Another large part of the processing power is used for operational support systems (OSSs). These automated systems perform functions previously done manually, as well as new functions never done before. Improved productivity and reduction of personnel result from this mechanization of tasks and from the centralization of work groups that some OSSs allow. Staff personnel at UTS headquarters reviewed these systems and all others planned or under development. They identified the need for a cohesive, long range plan to make better use of

existing systems and to control future development. As best they could, they had to determine where the telecommunications industry was going, and what UTS needed to do to function efficiently in that future environment.

The joint effort resulted in a 5-year plan for the Engineering and Operations Dept. (E&O).

Information will be a key resource in tomorrow's business environment and automated systems can provide quick access to accurate data for analysis and decision making. Staff personnel also recognized that automation would be a major component in meeting the future service and productivity goals of UTS. But, automation results in change, changes in organization, work functions, and in employes (Figure 1). In creating a 5-year plan, a developmental formula was used which asked the following questions:

- Where is UTS today regarding work functions, organization and automated systems? What are tomorrow's requirements?
- What redundancies between systems could be eliminated?
- What new operational support systems could be developed to improve productivity? How would they affect work functions?

The 5-year plan is detailed and complex. One of the plan's key new concepts is the control center. These centers will be the point of customer contact and will control the day to day provisioning and maintenance of telephone service. To do its job, each of the control centers will use enhanced versions of the following OSSs which are already in place:

Service order entry (SOE). This system provides for the creation and tracking of telephone service orders.

Customer record billing (CRB). This system interfaces with SOE to record and update customer information necessary to accurately produce billing.

- **Automated repair bureau system (ARBS).** This is a mechanized record and test system that receives, tests and closes trouble reports. It also maintains the subscriber line record.

Customer loop assignment system (CLAS). This system interfaces with SOE and ARBS. It makes outside plant and central office (CO) assignments, provides the facility information for paperless line record in ARBS, and furnishes automated support for rearrangement activities.

A new OSS, called force management system (FMS), currently is under development. It will tie all the systems together so each control center can administer demand and scheduled work.

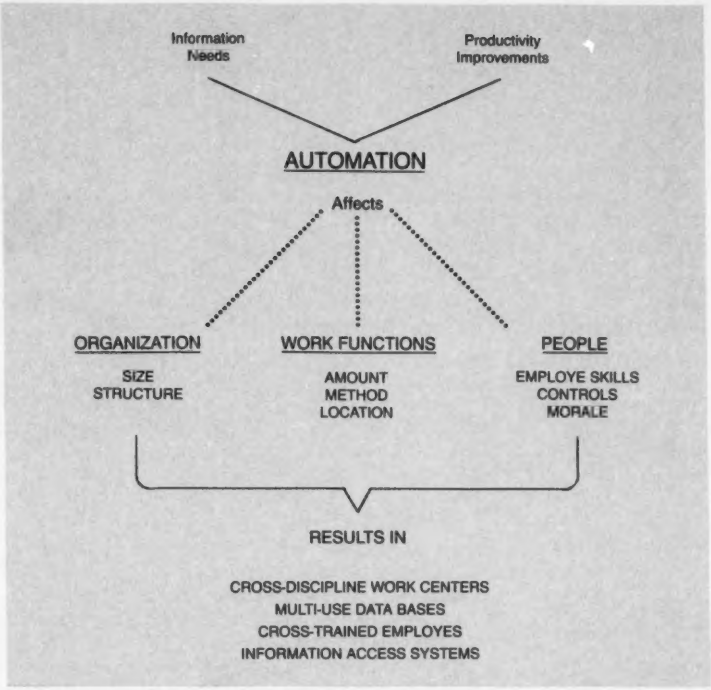

FIG. 1 *Diagram illustrates the results of automation.*

FMS will:

- Interface with SOE and ARBS and generate a recommended work load by individual. It takes into consideration all scheduled and demand type work, required time, travel time, available time, work force qualifications and geographic efficiencies. Also, it will dynamically revise schedules by priority.
- Automatically generate a schedule for routine maintenance work for any CO equipment, trunks or special activity.
- Dispatch work and track progress. It interfaces with SOE and ARBS for completions and inquiries.
- Analyze all completed tasks, produce service results and generate natural work measurements based on hours, price them to actual completion time, and interface with the payroll system.

Perhaps the easiest way to envision the interactions among these systems is to trace their application to a basic service order and to an ordinary repair call. For basic service orders (Figure 2), the customer (see 1 in the figure) will make a service request of the clerk at the control center, and the clerk will enter the order (2) into the SOE system. SOE will interface (3) with CLAS, which will make all outside plant and CO assignments, and return the order with assignments to SOE (4). If dispatch is required, SOE interfaces (5) with FMS, the force management system, to have the order priced with time, scheduled and loaded to the appropriate employe by geographic area (6). Personnel at the control center can dispatch the order (7) to the work force verbally, or have it printed at a remote site. After completion by outside plant (OSP) forces (8), and a manual entry (9) by the control center clerk, FMS will close (10) to SOE, which will add account information (11) to the CRB file, create a paperless line record (12) in ARBS, and close the order (13) to CLAS, which adds assignment information (14) to the ARBS line record.

For a simple repair call (Figure 3), the customer (1) will give notification of a repair problem to a clerk at the control center. The clerk will (2) locate the appropriate line record in the ARBS database and make a trouble report entry. ARBS will refer the report (3) to an automated test system (ATS) for a demand test, the results of which will be returned (4) to ARBS and the clerk, who will review it with the customer and provide a commit time. Test results showing outside

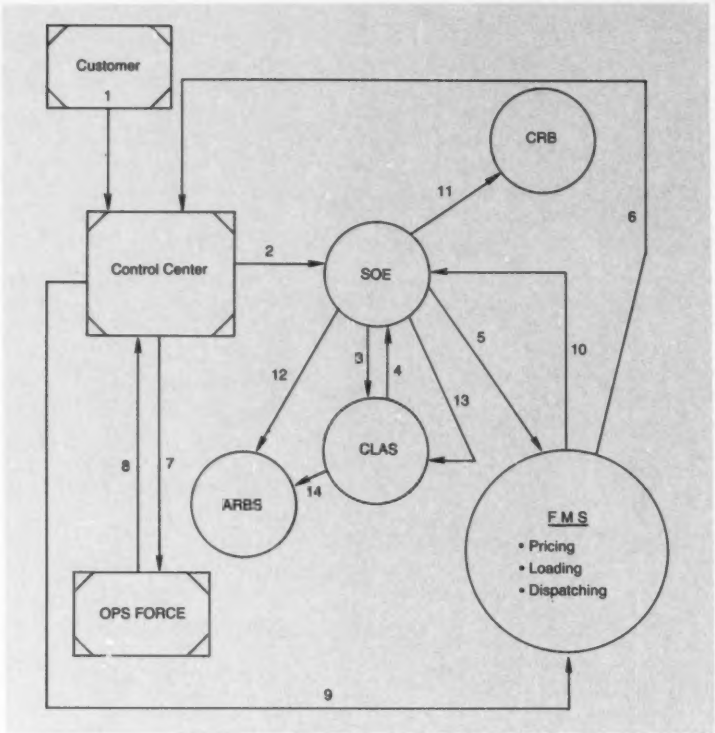

FIG. 2 *Basic service order interactions.*

plant or station faults will automatically be fed (5) into FMS which will price, schedule and load trouble (11 and 12) to the repair force for outside plant. Test results that show no outside plant or station faults will automatically be referred (6) to a network support center for network and central office equipment (COE) testing (7 and 8). Test data showing a network/COE fault will be fed (9) to ARBS for a line record trouble report entry, to FMS (10) and to the clerk at the control center (11). The control center will (12) dispatch the work to the proper repair force, track the report, clear and close it (13 and 14) to FMS, which will (15) update ARBS.

FMS is like the keystone in an arch. It will provide for common dispatch of installation and repair work, thereby reducing double dispatch. It will prioritize work, assign it to a qualified person and route it efficiently. And, by interfacing to existing service order and repair systems, it will free field supervisors to concentrate on quality rather than on scheduling and assignment.

Other uses

Use of automated systems for engineering has also expanded dramatically. Traditionally, switch selection and design of the outside plant loop had little affect on each other. However, digital offices loop electronics and fiber optic cable have forced the issue of examining the compatibility of both inside and outside plant. Here, too, automated systems allow UTS to integrate engineering functions and to centralize overall planning.

As planned, the general planning center (GPC) will have the responsibility for developing and cost justifying all projects, and compiling and administering the construction budget, capital recovery data and the overall company plan. The GPC can be seen as the architect of the network. The network engineering and the distribution groups can be seen as the engineers and builders of the network. The following mechanized systems support the groups:

Continuing property records (CPR). This system maintains detailed property unit records.

Customer loop assignment system (CLAS). This system provides cable fills and defective pair information. It creates cut sheets and performs mass throws.

Revised work order module (RWOM). A system for recording authorization information pertaining to estimated and actual requirements, and producing status and activity reports on projects, specific estimates and work orders.

Interactive graphics (IAG). This is a computer aided drafting system which also serves as a recordkeeping system.

Additionally, the following support systems for the GPCs are under development or are being purchased:

Network planning system (NPS). This system will automate the determination of traffic, hardware, investment and expense elements required of a study. It will allow more effective sensitivity analysis and creative network study development. It interfaces with a purchased system called capital utilization criteria (CUCRIT) and will provide the following modules for economic studies: outside plant, switching, exchange access, facilities, network services and operator services.

Construction Budgeting System (CBS). This system provides interactive administration of the construction budgeting process.

Construction management operations system (CMOS). This system will aid in the administration and control of construction work orders. It will serve as a means for reporting construction time and materials to accounting through existing systems, and provide a mechanism for estimating the cost of work orders.

Material management system (MMS). This is a system for control and management of physical inventories purchased and stored in warehouses; it has historical and forecasting capabilities.

Mechanized purchasing system (MPS). This is a requisition and purchase order automation system.

How will a GPC tie these systems together to produce a product? The flow of a specific work order illustrates their use and interfaces (Figure 4). A planner at the GPC (1) will use the NPS system interfaced with CUCRIT (2) to prepare and obtain approval of a project. NPS would have obtained graphic facility data from the OSP interactive graphics system, and facility utilization data from CLAS. The final approved project automatically will be fed to the CBS system for the budgeting process (2). The approved project (3) will go next to distribution engineering personnel (4), who will use CLAS, RWOM and more detailed levels of the IAG system (5), plus any field work (6) needed to create the work

Continued on page 36

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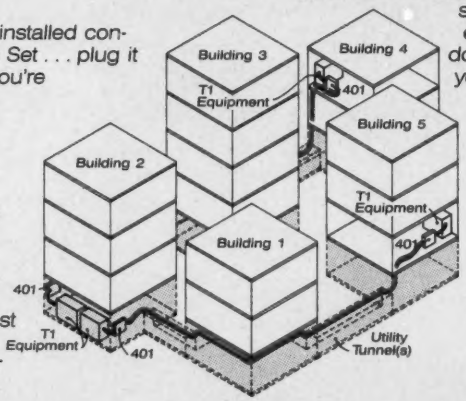

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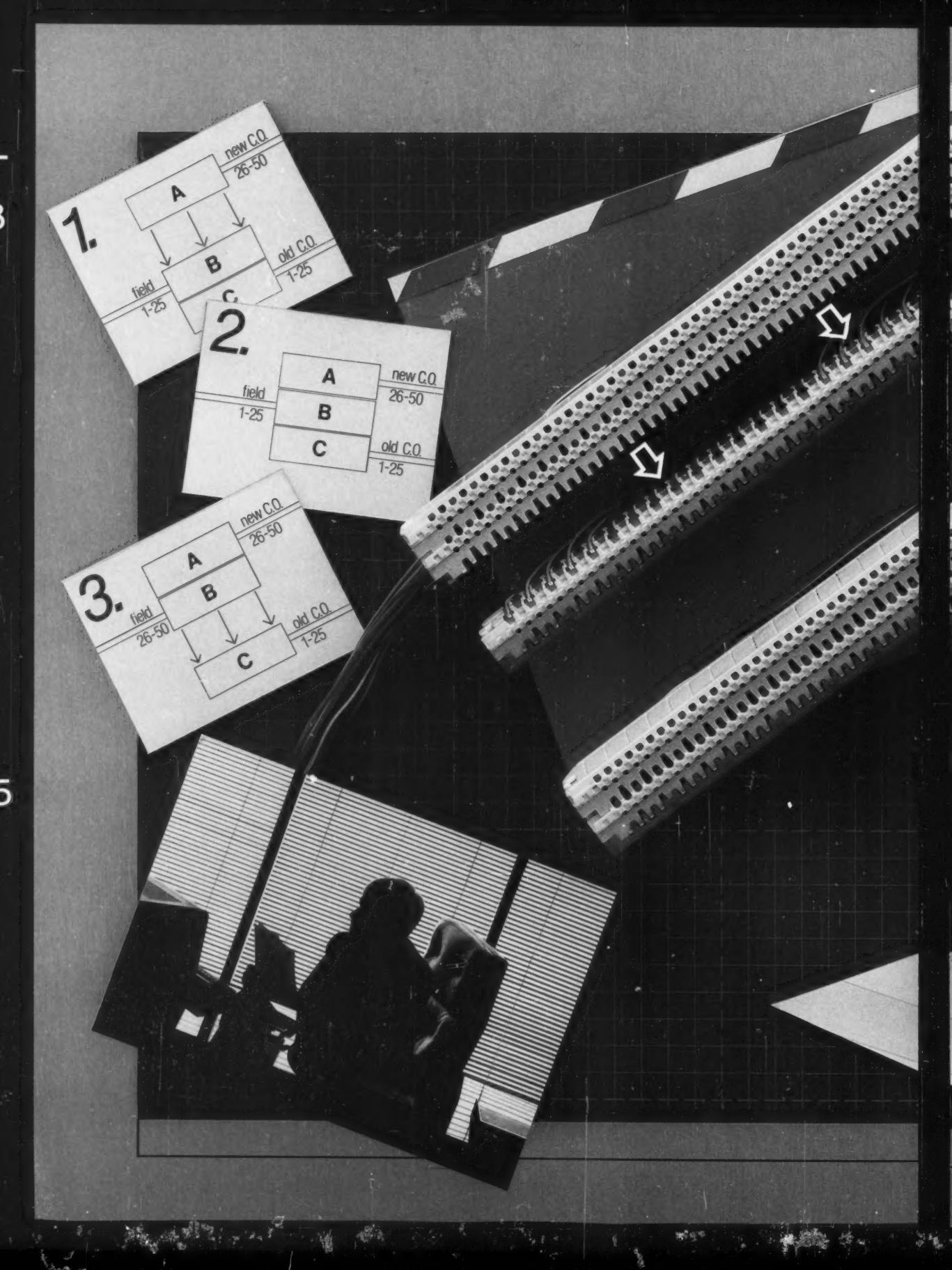
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order. It then will progress automatically to the CMOS system (8) for pricing and loading, and implement the MMS and MPS systems for the procurement of material. Any necessary data will be submitted to (9) the RWOM system. Next, the work order will go to construction (10), whose forces will do the prescribed work. After the work has been done (11), the CMOS system (12) will provide work order completions to IAG, which automatically updates the OSP-CPR database. Also, CMOS will feed accounting information into RWOM (12).

One result of the proposed integration of all these systems is that it is possible to automate service provisioning. There are many variations of automated service provisioning. However, fully automated service provisioning means that computer systems assign equipment and facilities, distribute orders, test any order where continuity has been established through dedicated or computer controlled facilities and equipment, and create a billing record. After initial input of customer requirements, service is provided without human intervention.

UTS is in a unique position. Its digital switch implementation plans, coupled with development and implementation of automated systems, provide it with vehicles to establish automated service provisioning within the near future. The remote switch administration system (RSAS) is the only additional component UTS will need to fully automate the process. RSAS will interface with CLAS and automatically update digital switches by due date.

Figure 5 shows how the automated service provisioning process will work. After creation in SOE (1), CLAS will assign equipment and fa-

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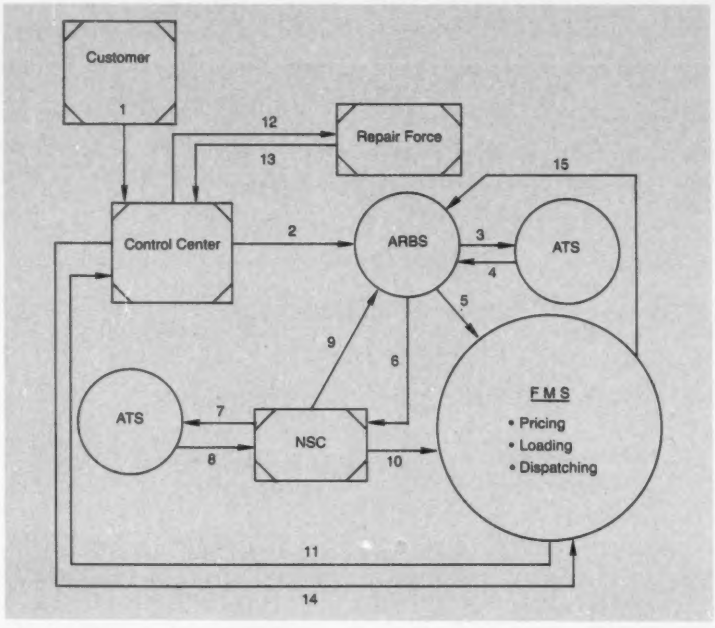
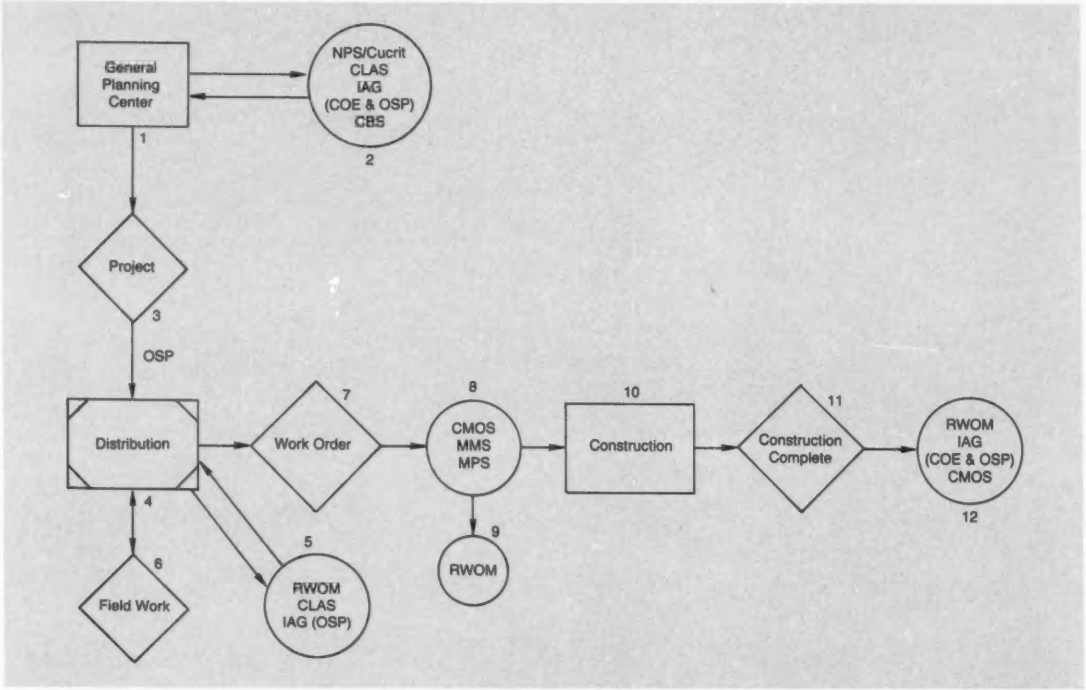


FIG. 3 *Ordinary repair interactions.*

FIG 4 *Diagram illustrates the specific work order flow.*



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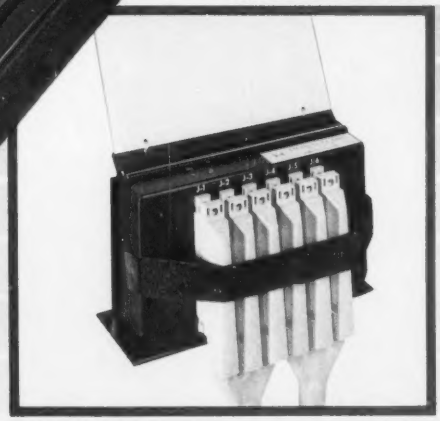

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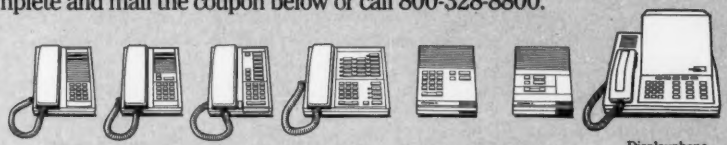

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See the Unity Line at the USTA show, booth #2541, February 12-14.

To: Northern Telecom Inc. Advanced Communications Terminals Division, P.O. Box 2020248, Dallas, TX 75220

☐ I would like to know more about the Unity Line.

Name_____ Title_____ Company_____ Phone_____ Address_____ City_____ State_____ Zip_____ TV2-85

cilities (2), identifying whether they are dedicated or not. Interfacing to CLAS and keyed by due date, the RSAS will pass number, line group/terminal number and class of service, including party, to the appropriate switching entity (3 and 4). Automatically, either a programable or a dedicated frame (5) will establish continuity to the outside plant. If the frame wiring is not dedicated, an order will have been transmitted to FMS for pricing, loading and dispatch. Continuity to customer premise (6 through 10) is established through the feeder plant, the integrated subscriber loop carrier remote terminal or mechanized cross connect box, and the dedicated distribution cable and drop to the customer premise. Again, if any of these components are not available or not dedicated, CLAS will identify that the service order requires a dispatch, and it will be sent to FMS for processing. The control center will use ATS (11) to test the order and send it (12) to SOE, which will update interfacing systems.

Other factors

With continued automation of work operations, the impact on employes becomes more and more critical. Extensive research is underway in many industries to learn what difficulties work groups experience in changing from a manual to a mechanized mode. This research indicates that employe attitude, training, open communications between management and non-management employes and peer relations have much to do with how successfully automation is implemented.

Clearly, jobs change in nature in an automated environment. Skill requirements are different, too. Preparing employes pyschologically for automation and providing good training are important requirements that corporations must meet today and in the future.

The issue of stress in an automated environment is another area that corporate management must understand more fully. Research indicates that some of the resistance is due to the psychologically stressful nature of some automated clerical jobs. These jobs have been characterized by David J. Cirillo, writing in the December 1983 issue of Management Review, as ". . .high in demands (deadlines, volume of work, limited resources, performance standards) and low in control over the immediate work environment." Physical stress

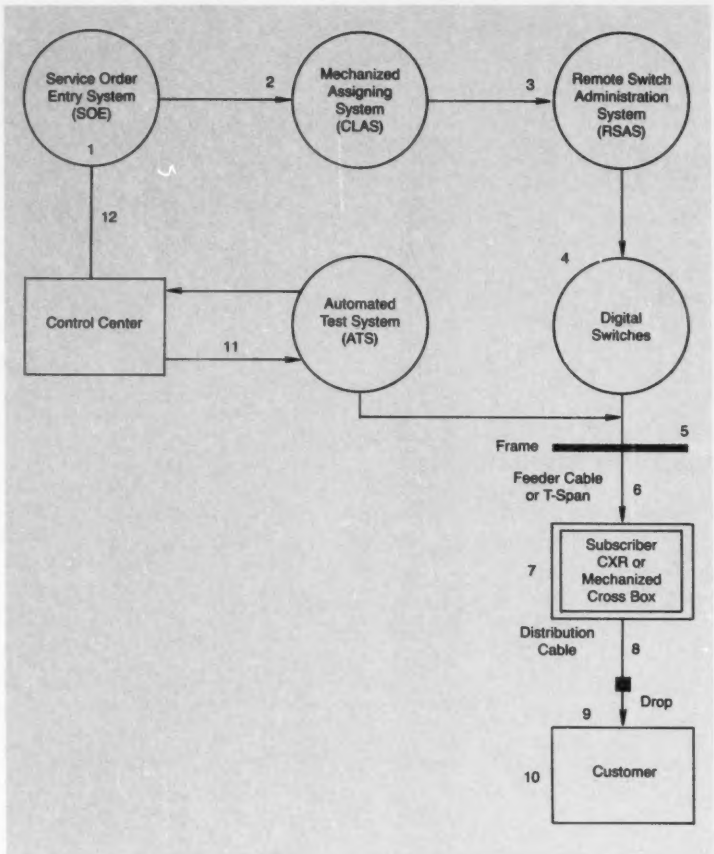

FIG. 5 *Automated service provisioning.*

caused by poorly designed equipment, furniture, workstations and office environments is another important component of employe morale and productivity.

Of course, deregulation has transformed the telco environment, to put it mildly. No longer is the telephone business a protected, rate base regulated industry. Instead, it is a regulated business that must compete in an increasingly market-driven industry where cost control is vital.

Automated systems allow planning, organization and control of labor intensive activities. William O. Fleckenstein wrote an article in the September 1982 issue of the Bell Laboratories Record which stated that automated support systems have allowed Bell operating companies (BOCs) to continuously decrease costs. The article cites a 5% productivity gain each year since 1972. In 1982 each BOC employe handled twice as much business as in 1972, the article said, and they did it more quickly and accurately while improving service to the customer.

Even as the number of access lines has been increasing, UTS has been methodically reducing employes. In fact, from December 1979 to February 1984 the number of UTS employes declined by 12%.

What portion of the reduction is due to automation alone is undetermined. However, automation does facilitate consolidation of work groups and combination of functions. Therefore, since 75% to 80% of controllable operating expenses are attributable to wages and benefits, UTS is expected to continue its drive to reduce expenses by expanding its deployment of integrated automated systems.

Automation will continue to be an important and dominant tool for productivity and service improvements in the telecommunications industry. Whether as a large mainframe system or a desktop PC, the computer opens breathtaking possibilities for the future of the telecommunications industry. How well corporations manage that tool will determine how they prosper. □

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Upgrade vs. replacement: studying the possibilities

In many cases, upgrading existing equipment makes better economic sense, as many carriers and telecommunications administrations have discovered to their profit

HECTOR MEDINA

MANY SMALL companies, using state of the art technology, are specializing in the design of products to modernize and update existing telephone plant equipment. Taking advantage of low cost microprocessors and other electronic components, these companies provide devices that will upgrade old electromechanical systems to current service standards, with savings in investment for the companies and national telecommunications administrations (PTTs), and improved services for subscribers. Major PTTs and carriers around the world, such as the Bell operating companies (BOCs), GTE Corp. and British Telecom are involved in large upgrade programs for existing step-by-step and crossbar systems.

For developing countries, this approach is even more attractive, as economic realities and sensible adaptation of technological advances provide the best compromise between the need for large investments in new telephone plant and optimum utilization of existing systems.

It is very difficult, if not impossible to justify, economically or otherwise, discarding existing electromechanical equiment, when modern technology can extend its useful life by 10 to 15 years, with only modest investments required to upgrade to current service standards.

The economic advantages derived from advanced technology products in all types of applications, are generally taken for granted. In most instances, this assumption is valid. An obvious example is the technological evolution and resultant decreases in the cost of the transistor radio and calculators, where economies of several orders of magnitude were achieved with the designs based on new components from the electronics industry. In these cases, of course, replacement is cost effective.

In other instances, however, because of the nature of the product or the service provided, this is not necessarily true. Where heavy initial investments were required, it makes more economic sense to upgrade or modernize equipment than to replace it.

Computers manufactured 10 years ago often can be updated by using new software programs. This is particularly important in the telephone industry because the required long life of the equipment and high initial investment usually makes it uneconomical to replace switching systems and outside plant with every change of technology.

Although the latest technologies are the most publicized aspects of telephone plant development, the fact remains that major carriers and PTTs also are investing large amounts of capital in updating and modernizing large quantities of existing step-by-step and crossbar installations.

This is not surprising, of course. Just as technology exists for the design of sophisticated new telephone switching and transmission systems, technology also exists to design add-on equipment that will update and modernize in-service, old generation systems. There are already many companies in the market that specialize in updating and modernizing products, and their number keeps growing.

'The addition of special devices to enhance operation of existing plant creates homogeneous service for both old system and new system subscribers.'

The addition of special devices to enhance operation of existing plant creates homogeneous service for both old system and new system subscribers. The overall result is that a subscriber connected to an old step-by-step system equipped with modernizing devices, for example, will be unable to notice any difference in service from the service available to a subscriber connected to the most recent digital system.

Among the many products on the market, there are add-on or outboard

THE AUTHOR
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devices that complement existing system operation and add facilities or features, including:

- Providing new signaling protocols, speeding the call processing cycle and acting as interface circuits to make the operation compatible with new systems. Thanks to the versatility of the software and the low cost of the microprocessors, this capability can be economically integrated at the trunk level, without modifying the existing exchange. Complex protocols using multifrequency signaling, such as International Telegraph & Telephone Consultative Committee (CCITT) R1 and R2, can be added to any exchange by a simple replacement of the trunks.
- Providing the numbering and routing flexibility of modern stored program control exchanges to existing electromechanical systems. Functions such as digit analysis, addition and deletion for standardization of numbering plans and alternate routing can be added through microprocessor controlled smart selectors or director equipment.
- Adding line and terminal capacity for service to new subscribers, or trunks to increase traffic handling capacity to existing exchanges. This is accomplished with modern technology equipment designed to be compatible with electromechanical systems in service for many years. The expansion or replacement of old equipment is made economical by the availability of new versatile electronic hardware, firmware and software components. This is especially important in cases when the original type of equipment is no longer in production.
- Providing new services such as direct long distance and international dialing with detailed billing. This is accomplished with the addition of centralized automatic message accounting equipment at the toll exchange. Again, through the use of microprocessor controlled equipment, automatic identification of the calling subscriber can be added at a very low cost per line to existing exchanges.
- Providing outboard detailed billing facilities for local measured service and long distance traffic to subscribers of existing switching systems that do not have this facility. With the increased emphasis on usage-related charges, this facility is particularly important for improved control and management of subscriber revenues. For maximum economy, monitoring of dialed digits is done at points of traffic concentration in the switching system, such as line finders in Strowger-type equipment, and registers, markers and intraoffice junctors in crossbar exchanges.
- Providing special services to subscribers; these services include call waiting, call transfer, abbreviated dialing and pushbutton service. This can be accomplished on a per line basis as requirements dictate, allowing the telco or PTT to install and charge for special services only for those customers that actually require the facilities.

The availability of these products, individually or in groups, creates a convenient situation for telcos and PTTs. They now can plan and implement projects to provide modern services to existing subscribers at minimum investment, while at the same time extending the useful life of their already amortized equipment for an additional 10 or 15 years.

Among the many telcos or PTTs in the planning or implementation phase of modernization programs are:

BOCs. With about 11 million lines of step-by-step equipment and 29 million lines of crossbar systems in service, BOCs are constantly improving and upgrading their networks to provide homogeneous service to all subscribers. One supplier, for example, has provided BOCs with the following electronic modernization equipment for 1980 through 1984: 9500 lines, 7700 terminals and 1600 selectors as additions and replacements for existing step-by-step exchanges and 30 automatic number identification (ANI) systems for as many electromechanical exchanges.

GTE. In 1980 through 1984, GTE acquired the following equipment for modernization of its existing step-by-step and electromechanical exchanges: 44,000 lines, 45,000 terminals, 5100 selectors, 170 ANI systems and 22,000 trunk pre-selectors.

British Telecom. British Telecom has approximately 23 million lines of Strowger and crossbar equipment in service, and is in the process of adding modern facilities to this large electromechanical installed house that makes up 85% of its total network. In 1982 the budget for this project was about £150 million (or $222 million U.S.).

In 1984 and under its Star Service, British Telecom has placed orders totaling £20 million to upgrade 200 Strowger, crossbar and TXE 4 exchanges to System X standards. System X is a digital switch.

'For developing countries . . .economic realities and sensible adaptation of technological advances provide the best compromise between the need for large investments in new telephone plant and optimum utilization of existing telephone systems.'

Developing countries

From the perspective of economic reality, the need to maintain existing equipment in service for as long as practical is most important for developing countries. In places where telephone density per 100 inhabitants is less than 10 and where prospective subscribers have to wait many years to obtain a working telephone, it is not justified economically or otherwise to make the large investments required to purchase new and sophisticated equipment, usually at the expense of scarce foreign currency reserves, when an alternative exists to upgrade the existing equipment at a fraction of the total replacement cost.

Fortunately, the replacement of older systems is becoming less common as the technical departments of the PTTs of developing countries learn to manage their companies' resources with a policy driven by economics and service, rather than by unquestioning and untimely utilization of the latest technology.

In the short term, this will be translated into modern telephone service for a larger number of subscribers and keep investments in line with the particular country's economic possibilities. □

ComNet '85 aims to upgrade telecom skills

PEGGY NELSON, ASSISTANT EDITOR

THE SEVENTH annual Communication Networks Conference (ComNet), to be held Jan. 28-31 in Washington, promises to have a program that will address the problem of upgrading professional and technical skills needed to deal with the opportunities created by divestiture.

Last year's conference had a total attendance of approximately 8000 people with more than 1500 attending the various seminars. Approximately 750 booth spaces are available for ComNet '85 and the conference organizers are expecting a larger crowd than last year.

In keeping with the convention's theme of upgrading skills, more than 75 technical panels have been scheduled to bring users up-to-date information on the latest developments in voice and data network design, bypass technologies, regulatory issues, local networking and other issues pertinent to the telecommunications industry.

More than 200 companies will exhibit the latest advances in their telecommunications products and technology. The exhibits will be open from 10:00 a.m. until 5:00 p.m. Tuesday, Jan. 29 through Thursday, Jan. 31.

As usual, ComNet will present its town meetings. On Tuesday, Jan. 29, the Town Meeting on Regulatory Policy will be held at 4:30 p.m. The topic which will be addressed is the future of long distance communications service. The speakers for this panel discussion will be William G. McGowan, founder and chairman of MCI Communications; Randall L. Tobias, senior vice president of American Telephone & Telegraph Co. (AT&T); Thomas E. Bolger, chairman of the board of Bell Atlantic; and, Robert LaBlanc, investor and financial consultant.

Two new programs have been added to the seminar agenda. Voice Network Spotlight will deal with new developments in voice communications, private branch exchanges, voice mail and network management for the new user. The second program, titled New Horizons, is designed to help the more experienced user with advanced applications in areas such as artificial intelligence in network software and fiber optic networking.

Visit Telephony at ComNet '85— Booths 1003, 1005

The agenda of seminars and panel discussions for Monday afternoon through Thursday is overflowing with various topics and issues covering almost every angle of this diverse industry.

The conference begins Monday with 13 in-depth seminars and a lecture by James Martin. Some of the topics for these seminars include Local Area Networks; The PBX Today; New Carrier Tariffs and Access Tariffs and Their Effect on Network Economics; Strategic Planning for Integrated Communications and Federal Telecommunications—Practices, Rules and Trends.

"An Evening with James Martin" will begin at 4:30 p.m. and is open to "in-depth" registrants. Martin has written more than 30 best-selling books on computers and telecommunications and has lectured to industry professionals throughout the world.

Tuesday's activities commence at 7:30 a.m. with a presentation titled, "The Gospel according Harry Newton." Throughout the day simultaneous seminars also will be held. Topics to be covered include the Washington Scene; New Horizons: ISDN; Federal Government Telecommunications Requirements; Network Technologies: Network Standards; Access to the Local Exchange; New Horizons: Fiber Optics; Network Design Techniques and more.

Wednesday's activities start at 7:30 a.m. and continue until 5:00 p.m. Some of the subjects to be discussed include: Trends in Electronic Mail/Message Systems; Tariff Information Databases and Services; Industry Issues: AT&T vs. IBM in Networking; and Intra-LATA Services and Bypass.

Thursday's sessions, beginning at 7:30 a.m., wind up the week's activities. Topics to be explored during these sessions include: Network Technologies: Security Issues; After Access Charges: Federal/State Regulations; the New Video Marketplace; Call Accounting and Reporting Systems; and High-Speed Voice-Grade Modems: A Technical Analysis.

For more information on ComNet '85, contact CW Conference Management Group, 375 Cochituate Rd., Rt. 30, Framingham, Mass., 01701; telephone: (617) 879-0700.

ComNet '84 exhibition booths were well attended. This year's conference will have more than 200 exhibitors and even larger attendance than last year.

ComNet '85: What to look for on the exhibition floor

Here is a sampling of the products which will be exhibited at the Comnet show. The products have been arranged in alphabetical order according to company name

FILE MANAGEMENT SYSTEM/ The ACCES File Management System offers a full complement of file transfer, access and maintenance services through interactive and runtime interfaces. Complete files, individual blocks and individual records can be manipulated across a network regardless of the different operating systems' file management structures. A key feature is its network file header which is permanently maintained with the file and assures that no information is lost as the file is moved, although each host may maintain different file attributes. ACCES uses the publicly available Courier Presentation Layer protocol which corresponds to the sixth layer of the Open Systems Interconnection reference model promoted by the International Standards Organization. *Advanced Computer Communications*

Reader Service Card No. 190

LONG DISTANCE SERVICE/Allnet offers long distance calling service with 6-second rounding after the first minute plus volume discounts with no start-up, monthly subscription or minimum usage fees. *Allnet Communication Services Inc.*

Reader Service Card No. 191

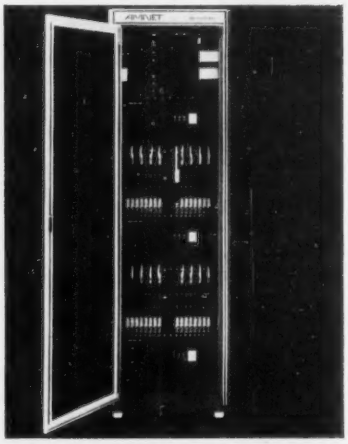
NETWORK COMMUNICATIONS/ The 980 Series Data Sets, 2200 Series Time Division Multiplexers, 4410 Packet Switching Systems and 4400 Series PADS (pictured) for access to X.25 Packet Networks will be displayed. These products provide users with a variety of options for accessing computers from remote sites over public or private data networks. They have built-in centralized management capabilities to speed and simplify network changes. The 4705 Front-End Processor, which provides the interface between public or private data networks and the central processor, offers compatibility with existing network architectures while providing advanced operating characteristics. *Amdahl Communications Systems*

Reader Service Card No. 192

TRANSMISSION LINK/The RL5000 Ethernet Expander extends the transceiver-to-workstation distance up to 500 meters from its present limit of 50 meters without a repeater. The RL5000 has activity lights for transmit, receive and collision detect signals, plus indicators showing use as a transceiver or controller RL5000 and a power supply fault lamp. Power is supplied by the RL5000 to the transceiver at the Ethernet coax. The RL5000 is compatible with a variety of controller-end devices and is supplied in a table top or 19-in. rack-mount version. *American Photonics Inc.*

Reader Service Card No. 193

PACKET SWITCH/The Nucleus 6000 Packet Switching System is a modular, multimicroprocessor that was designed



Continued on page 46

specifically for high-throughput data networking. The system offers improved resource utilization, increased network flexibility and enhanced network control. *Amnet*

Reader Service Card No. 194

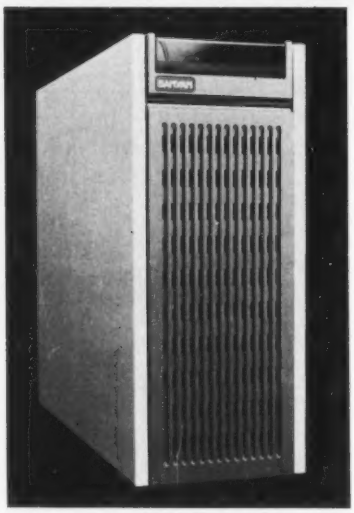
PUBLICATION/"Post Divestiture Tariffs and Their Impact on Large Networks" is a book that looks at the impact of post-divestiture tariffs, providing a framework for understanding these tariffs and the responsibilities of vendors and customers. Also discussed are the opportunities these tariffs offer, as well as strategies for maximizing the opportunities and minimizing the problems. *The Aries Group Inc.*

Reader Service Card No. 195

PUBLICATIONS/On display will be books and manuals on the Unix System V, 3B Computers, Merlin, AT&T System 75, engineering and operations in the Bell System, and other technical publications listed in the Commercial Sales Documentation Catalog. *AT&T Customer Information Center*

Reader Service Card No. 196

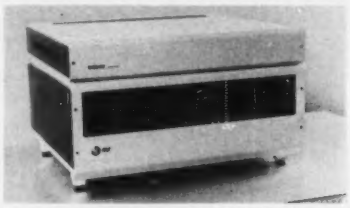
MICROCOMPUTER/The Banyan Network Server is the first hardware base on which Banyan Systems is implementing its VINES virtual networking system. VINES is a family of network communi-



cations and services software that permits the location, movement and use of information in personal computer networks and PC-mainframe environments. The Network Server is a high-performance supermicrocomputer optimized for disk and file sharing tasks and other network communication functions. *Banyan Systems Inc.*

Reader Service Card No. 197

DATA COMMUNICATIONS/Data products on display will include asynchronous and synchronous terminals, a complete line of modems and multiplexers, a network management system and two local area networks (LANs). Products highlighted will be the Datakit Virtual Circuit Switch (pictured) for link-



ing computers and terminals in both local and wide area networks, and proNET, a token ring LAN. *Bell Atlanticom Systems Inc.*

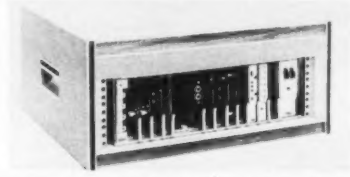
Reader Service Card No. 198

COMMUNICATIONS DEVICE/The Professional Communications Manager (PCM) is a micro to mainframe, micro to micro communications device for data transfer and text messaging with wide area

networking capability. Features included are asynchronous/bisynchronous communications, multiple modems, Auto Talk, Message Mode, text editing, concurrent operations, and print spooling and buffering. The PCM supports direct electronic mail and TWX or Telex connections and can be used with most major microcomputers. *BetaCom Corp.*

Reader Service Card No. 199

MULTIPLEXER/The C/I MUX Voice/Data multiplexer provides an output T1 bitstream compatible with AT&T's D3/D4 network frame format and signaling statistic requirements. With an architecture that meets network channelization re-



quirements, D/I MUX is designed for point-to-point and drop and insert (multipoint) applications. While offering a choice between 64 kb/s pulse code modulation toll quality or 32 kb/s voice and a variety of signaling options, D/I MUX also supports up to 144 9.6 kb/s synchronous data on a single T1 line. It offers data channel speeds from 1 b/s to 1,536,000 b/s and operates over twisted pair, satellite, microwave and digital radio, coaxial cables or fiber optics. *Coastcom*

Reader Service Card No. 200

MODEM/Tel-A-Modem is integrated into a two-line desk-type telephone that is compatible with virtually all of the most popular 212A command-type modems and with communications software packages such as Smartcom, and all RS-232C terminals and computers. The Tel-A-

Modem can directly replace other modems, thereby adding two-line capability to a data communications system. A direct-connect modem capability is built in so that the modem carrier can be used on either line, thereby leaving the telephone handset free for voice communication on the unit's remaining line. *Code-A-Phone Corp.*

Reader Service Card No. 201

MULTIPLEXER/The DSM-32 digital speech multiplexer is designed to work with either 56 kb/s or 64 kb/s digital voice channel plus up to three 9600 b/s data channels. Two of those data channels can be combined to create one 19.2 kb/s data channel. The voice channel uses a special algorithm which allows the passage of 9600 b/s analog modem traffic. Two- and four-wire E+M signaling is provided for the voice channel. *Coherent Communications Systems Corp.*

Reader Service Card No. 202

NETWORK SYSTEM/The Virtual Network System (VNS) is an attached processor that performs voice networking and automatic carrier selection at small to medium corporate network locations without dedicated private lines. The VNS supports 4 to 48 voice-grade channels and provides equal access capability, automatic carrier selection, remote access, remote polling and database management, and call accounting. *Communications Office Machines Inc.*

Reader Service Card No. 203

SATELLITE SERVICE/Digital Express is an all-digital International Business Satellite Service designed to provide multinational organizations with a means to integrate international voice, data and image communication applications into a single effective communications service. C- and Ku-band frequencies are used and national, urban or on-premise access points are available. *Communications Satellite Corp.*

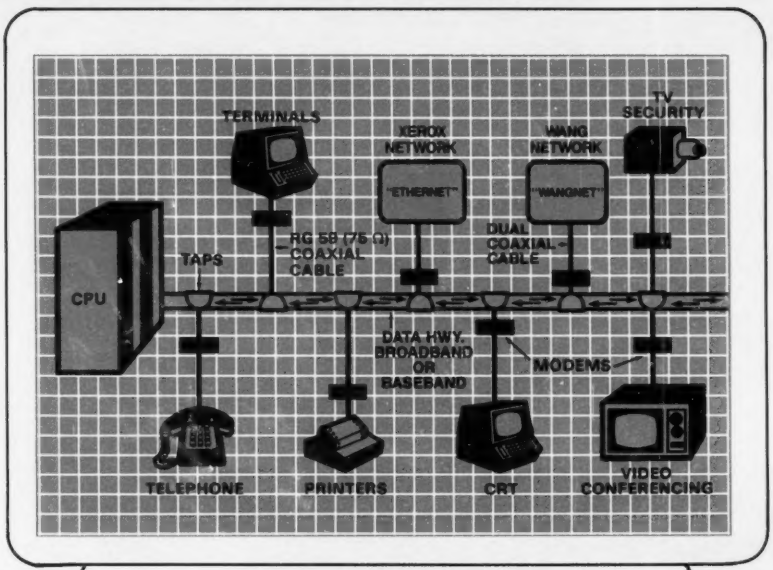
Reader Service Card No. 204

BYPASS TRACKING SYSTEM/The Compucon Bypass Technology Tracking System is available as part of its Card-File service. The system is compatible with IBM PCs and IBM ATs and provides geo-

Continued on page 50

Planning to install an LAN?

Anixter stocks the cables, connectors, & related hardware for Local Area Networks



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IF WE WERE YOU,

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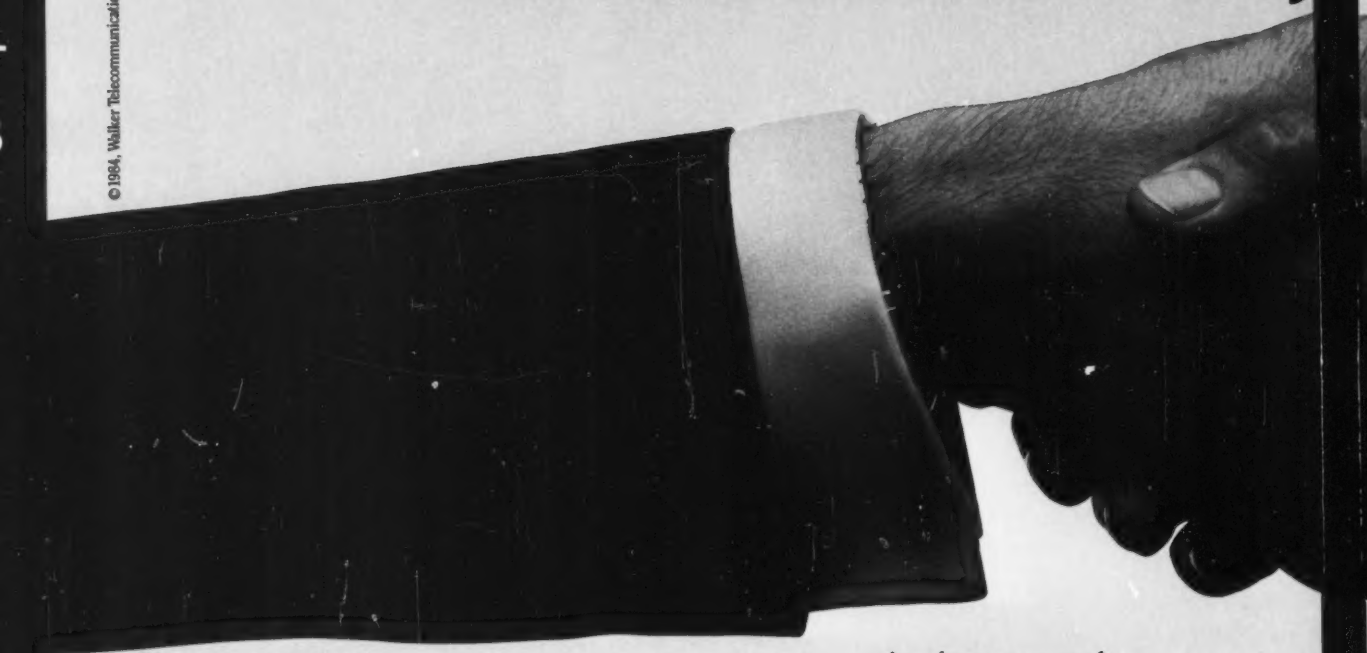


Sure, you expect us to say that. After all, it's in *our* best interest for you to do business with us.

But is it, you wonder, in *yours?*

It depends on what's in it for you. And what *isn't.*

We believe that the more you know about Walker, the more you'll want to do business with us. And we're investing in this ad to prove it.

No Hype. While everyone's touting their latest "breakthroughs," you've known the truth all along. *A phone is a phone is a phone.* Peel away the cosmetics and hype and one reputable manufacturer's equipment basically does the same as another's.

Which means you could probably succeed with any of the better brands. If hardware were all that mattered. But it isn't.

Commitment. Until someone develops a phone that stocks itself, ships itself, repairs itself, explains itself and most important, *sells* itself, good equipment is only the beginning.

You need people who *care* about you and your success. People to whom your business is *important.* People like the people at Walker.

Delivery. Ordering equipment is one thing. Getting it is something else. And when you don't, you've got a good chance of losing the sale.

That's why at Walker, we're stocked in *depth.* And staffed to turn around most orders in 24 hours or less.

Tech Support. Ever notice how easy it is to reach an order-taker at most manufacturers... and how hard it is to get someone in Tech Service? That's bad enough when you're spec'-ing out a system. But a downright disaster when you've got an angry customer breathing down your neck.

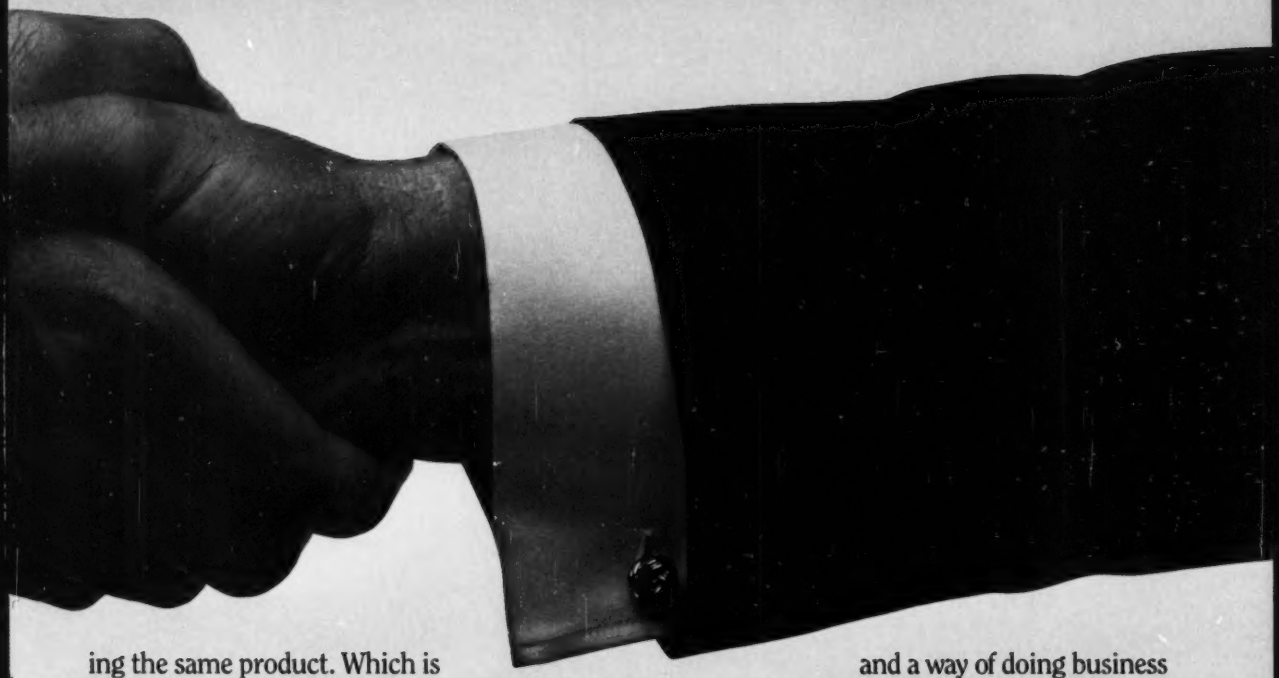
At Walker, we feel that if you're putting your reputation on the line by recommending our products, the least we can do is be there when you need us. That's why we're the only manufacturer we know with a *one-to-one* ratio of technicians to salespeople. Not just to give you advice when you need it—but to train your techs so you *won't* need it.

Product. If you sometimes get the feeling the industry's become a bells-and-whistles sweepstakes, you're not alone. No wonder there's so much confusion!

But we're not confused. We've listened to your customers. And recognize they're buying benefits: benefits they can get from the start, without a lot of training. Especially easy, instinctive operation.

Profit. There's nothing like working hard for a sale, only to find your competitors all offer-

WE'D BUY FROM US.



ing the same product. Which is great for some manufacturers. *But murder on you:* the winner in a bidding war is the one who loses the most profits.

We're smart enough to see that if you don't make a profit, in the long run neither will we.

Sales Support. Everybody says they give it. But what you get depends upon *who* gives it to you. And how.

At Walker, we back you with sales training from reps with a proven personal success record *on the street.* People with the experience to understand your problems. And the savvy to help solve them.

Credit. Or the Sales Prevention Department, as they're known by many distributors.

Sure, our credit people are also here to collect the money we're owed. But their most important job is to *help you sell more,* by expanding your credit line. And build even more sales through novel financing methods.

Promotion. The way some manufacturers promote, you'd think they want to keep their products a secret. But not us.

This year, we've mounted a massive advertising and public relations campaign to let your customers know about our products and our company. But that's only the beginning.

There's extensive dealer support material, too. Including some of the best product literature in the business. Dealer admats. Dealer ID. Clever ads like this one. And plenty more. Like a co-op advertising program, so we can match your investment in yourself with one of our own.

Talk to us. We started this ad with a claim that *any* manufacturer can make. But we believe it's one that only *Walker* can prove. Because of the way we've listened. And then designed a company, a product line and a way of doing business around what we heard.

A year ago we introduced three Reliant™ telephone systems. And the industry reaction has made us the fastest growing major key-system manufacturer in the business.

But we're not about to take you for granted. We've been listening to your suggestions about enhancements and new products—and you'll be seeing the results very soon.

Which, if you're already a Walker dealer, should make you think about selling even more Reliant systems.

And if you're not—well, maybe it's time we talked.

WALKER

Phones people like.

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LINK/1™ T-1 Facilities Management System
The Industry Standard By Which All Others Are Judged

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201-930-4600

Timeplex Canada Inc.
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Markham, Ont. L3R 4L9
416-475-1961

Timeplex Ltd.
North Parkway
Leeds LS14 6PX U.K.
0532/73-51-41

Timeplex Europe
Blvd. A. Reyers 207-209
B-1040 Brussels, Belgium
02/734-9703

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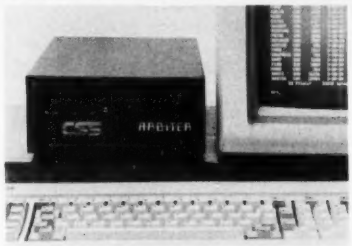
graphic reference of transmission facilities, ownership/market share information, equipment, modulation and channel capacity specifications of transmission facilities, and relationship to telco geography. Card-File locates competition and determines which presents the greatest concerns, approximates tariff charges from competitor POPs, determines market share based on channel capacity, evaluates city-pair requirements and formulates management reports. *Compucon Inc.*

Reader Service Card No. 205

SECURITY SYSTEM/Arbiter is a point-to-point real time hardware security system that cannot be decrypted, tapped, evaded, cracked or otherwise accessed. It utilizes random encryption that changes



with every transmission and terminal authentication. Arbiter transmits encrypted information in a manner so that data is not receivable on standard terminal equipment and disconnects unauthorized users within seconds, releasing the line from tie ups. *Computer Security Systems Inc.*

Reader Service Card No. 206

TELECONFERENCE SERVICE/Crash-Course is a marketing package of audioteleconferences that a manufacturer or supplier can provide to the customer with the purchase of a product. It allows the customer to talk directly with experts and other users about his recent purchase, to obtain instructions on use or technical assistance on the product. Crash-Course provides an incentive to purchase, ensures that the product will be used properly and enables the company to sell the customer on product enhancements or accessories or related products. *Connex International Inc.*

Reader Service Card No. 207

OPTICAL FIBER/Corguide dBF data/Broadband fiber for local access applications was designed to get the most coupled optical power into the fiber from the least

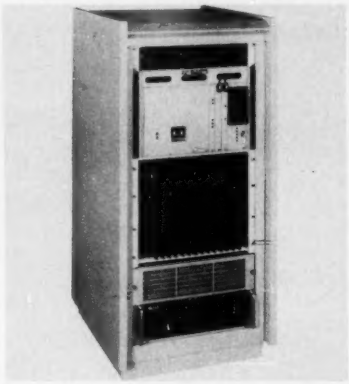
expensive light sources available and then maintain the power in the link through commonly available, inexpensive connectors and splices. Applications include the local loop portion of subscriber telephone networks, computer networks, cable television, utilities, manufacturing facilities, transportation systems, and mineral and resource extraction. *Corning Glass Works*

Reader Service Card No. 208

SWITCHING SYSTEM/The MSX is a non-blocking, 512-port, integrated data/voice digital switching system. Only two printed circuit boards comprise the common control equipment: The main processing unit originates the packet/data bus for control and signaling information as well as packet-switched data, and the time switch unit controls the circuit bus providing 512 64-kb/s TDM circuits for trunks, voice and data (one time slot each). *Cyber Digital Inc.*

Reader Service Card No. 209

DIGITAL SERVICE/DamaNet is a switched digital, fully integrated voice and data telecommunications service for nationwide intracompany networking. User voice/date/video services are digitized for



transmission via DTS or two-way cable locally and routed via satellite for long-haul distribution. DamaNet services are on a demand-assigned basis, with users paying only for capacity allocated and time actually used. *Dama Telecommunications Corp.*

Reader Service Card No. 210

TEST SYSTEM/The Modem Diagnostic Test System supplies central diag-

nostics that are totally independent from the modem vendor. The user can mix and match any vendor's modems and get a monitoring and testing capability from one central point. Also on display will be the Network Diagnostic and Test System, an IBM PC-based central test access system that provides a low-cost access system for centralized monitoring, alarming, testing and switching capabilities. *Digilog Inc.*

Reader Service Card No. 211

MICROWAVE RADIO/The DMC23 23-GHz microwave radio is used to carry voice and data communication between two sites. T1 and T2 transmission bit rates are available. The DMC23 uses only two cables to connect the antenna and radio

unit to the modem which can be placed on a desk, mounted in a computer cabinet or in a 19-in. rack. An internal backup battery keeps the system running even during a power failure. The user-programable scrambler provides built-in security. Extensive built-in diagnostics, including remote and local loopback testing, eliminate the need for expensive test equipment and simplify maintenance. *Digital Microwave Corp.*

Reader Service Card No. 212

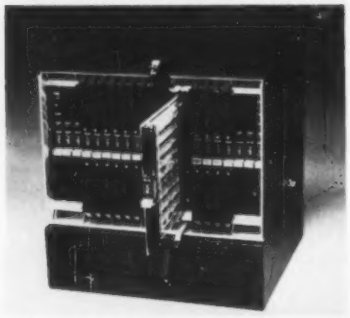
NETWORK CONTROLLER/DynaNet 52, a single IBM PC-operated software-based controller for the CTM-1000 Electronic Datacom Matrix Switch, offers users a nonblocked configuration, sizes up to 512 DTEs by 512 DCEs with autoredundant components, integral patching and full modularity. DynaNet 52 manages the CTM-1000 matrix and provides one centralized point for the handling of line and port information. *Dynatech Data Systems*

Reader Service Card No. 213

PORT SELECTOR/The Equinox DSS-1 Data PBX is one-sixth the size and one-seventh the weight of conventional port selectors and users the latest programable array logic to reduce the dimensions. From 24 to 1320 asynchronous computer ports and terminals can be connected simultaneously at 9600 b/s. The Data PBX provides user-controlled switching between computers, port contention to increase port utilization and

Continued on page 52

provide access management, including statistics on port utilization. Complete hot-standby power supplies, switching



logic and backplane with automatic switchover to ensure maximum security are featured. *Equinox Systems*

Reader Service Card No. 214

INFORMATION SWITCHING SYSTEM/The MD110 Digital Voice/Data information switching system is a fully distributed system that operates with the same twisted pair lines installed for telephones. The MD110 uses up to 124-line interface modules, each with capacity for 200 ports. Intelligence functions can be

activated anywhere in the system they are needed. Each module acts independently, but can also function together as one unified system so that operations can continue even if direct communication is lost between locations. Problems in one switching module therefore will not result in shutting down the rest of the PABX system. *Ericsson Information Systems*

Reader Service Card No. 215

DATA SWITCHING SYSTEM/The PACX 2000 is a software-based distributed data switching system designed to interconnect distributed intelligent data devices. It has an open network architecture and can tie together workstations and groups of workstations and connect them all to mainframe computing facilities. It supports asynchronous data rates up to 19.2 kb/s and is totally transparent to data speed and code. Four independent se-

curity levels and other features address security problems. *Gandalf Data Inc.*

Reader Service Card No. 216

MULTIPLEXER/The Megamux Plus is a software-based data, voice and video multiplexer that combines a broad array of

data, voice and video inputs over a single high speed link at up to 2.048 Mb/s. The system is capable of centralized network management and control via the Netcon Network Management System. *General DataCom Industries, Inc.*

Reader Service Card No. 217

DATA COMMUNICATIONS/This line of communicating tape systems is used for data communications, electronic funds transfer, call message data recording and data collection. Protocols covered with this equipment include asynchronous, bisynchronous (IBM 3780), X.25 LAPB and Centrex 94A, 93B. Data communications applications are designed for off-line tape-to-tape and on-line tape-to-host. *General Systems Center*

Reader Service Card No. 218

TEST SYSTEM/The Remote Access and Test System (REACT) is an automated transmission facility test system that tests any size network. REACT can test analog and digital voice/data from a single 4-kHz channel to a T1 circuit, in a point-to-point, multipoint and switched configuration. REACT can autoroutine a network and provide printouts of failure information in a user-specified format. *Hekimian Laboratories Inc.*

Reader Service Card No. 219

DATA TEST SYSTEM/Five new products for data communications testing will be shown, all designed to optimize network availability. The HP 4951, 4953 and 4955 family of protocol analyzers have user capabilities for merging standards, including application packages for X.25 cer-

tification and emulation, Systems Network Architecture, and CCITT No. 7. The user can monitor data transmission, simulate network components, perform bit-error tests and do remote testing. *Hewlett Packard Co.*

Reader Service Card No. 220

NETWORK MANAGER/The Network Command Center integrates information collected by the EMS-II Network Control module, the PMS-II Performance Measurement module and the NIS 90/60 Network Information module onto a central database. This integration provides customers with the ability to monitor, test, restore and manage both analog and digital lines for maximum network efficiency. *Infinet Inc.*

Reader Service Card No. 221

VIDEOGRAPHICS/Discon 725 13 in. high resolution Interactive Graphics Display is an accessory to the Discon 700 Compact Videographic Teleconferencing System. Graphics can be drawn directly onto the video image and instantly transmitted over ordinary telephone lines anywhere in the world. Seven-color annotation with multiple-line types and symbols are allowed. Discon 725 also can be used as a color display terminal for a professional computer. *Interand Corp.*

Reader Service Card No. 222

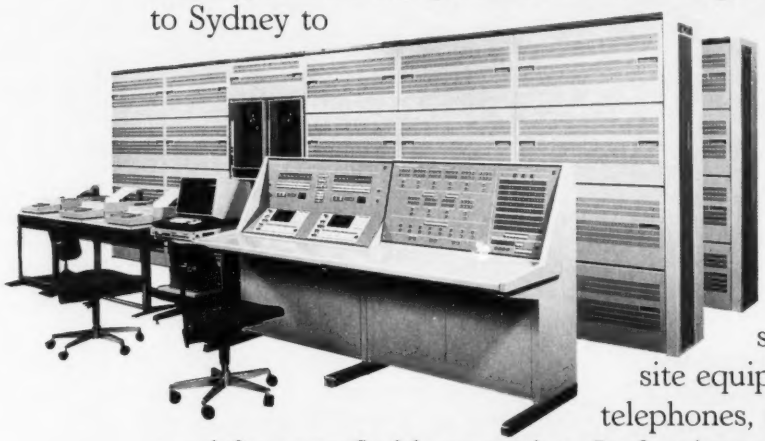
TERMINAL CONTROLLER/The Kaufman 8800 is a terminal and PC cluster controller concentrating up to 28 PCs. It provides protocol conversion from ASCII to IBM SDLC, IBM BSC and Sperry Uniscope. A standard terminal library is supplied. The user can add special terminals

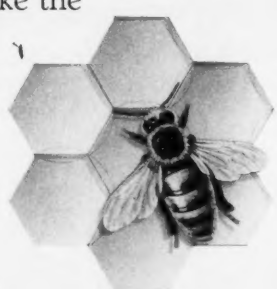
to this library. Connections can be direct or through modems. Security features, diagnostics and statistics are included. The

Continued on page 56

Take the sting out of your cellular decision.

Making that sensitive final equipment choice can be a painful process. But not when you choose the proven alternative – the Cellular System from NEC. NEC installed the world's first 800 MHz cellular system in Tokyo in 1979. Since then, we've put more systems into operation around the globe, from Singapore to Sydney to Mexico City. Today we're installing systems in markets across the U.S. Our turnkey system is based on the NEAX 61 digital switch, with cell site equipment, mobile telephones, everything you need for a profitable operation. In fact its user friendly design and unique subscriber features make the NEC Cellular System the sweetest deal you can find – for you and your subscribers. We'll be glad to tell you more. Just write or call for our brochure. No cellular system evaluation is complete without a close look at **NEC, the total system manufacturer.**





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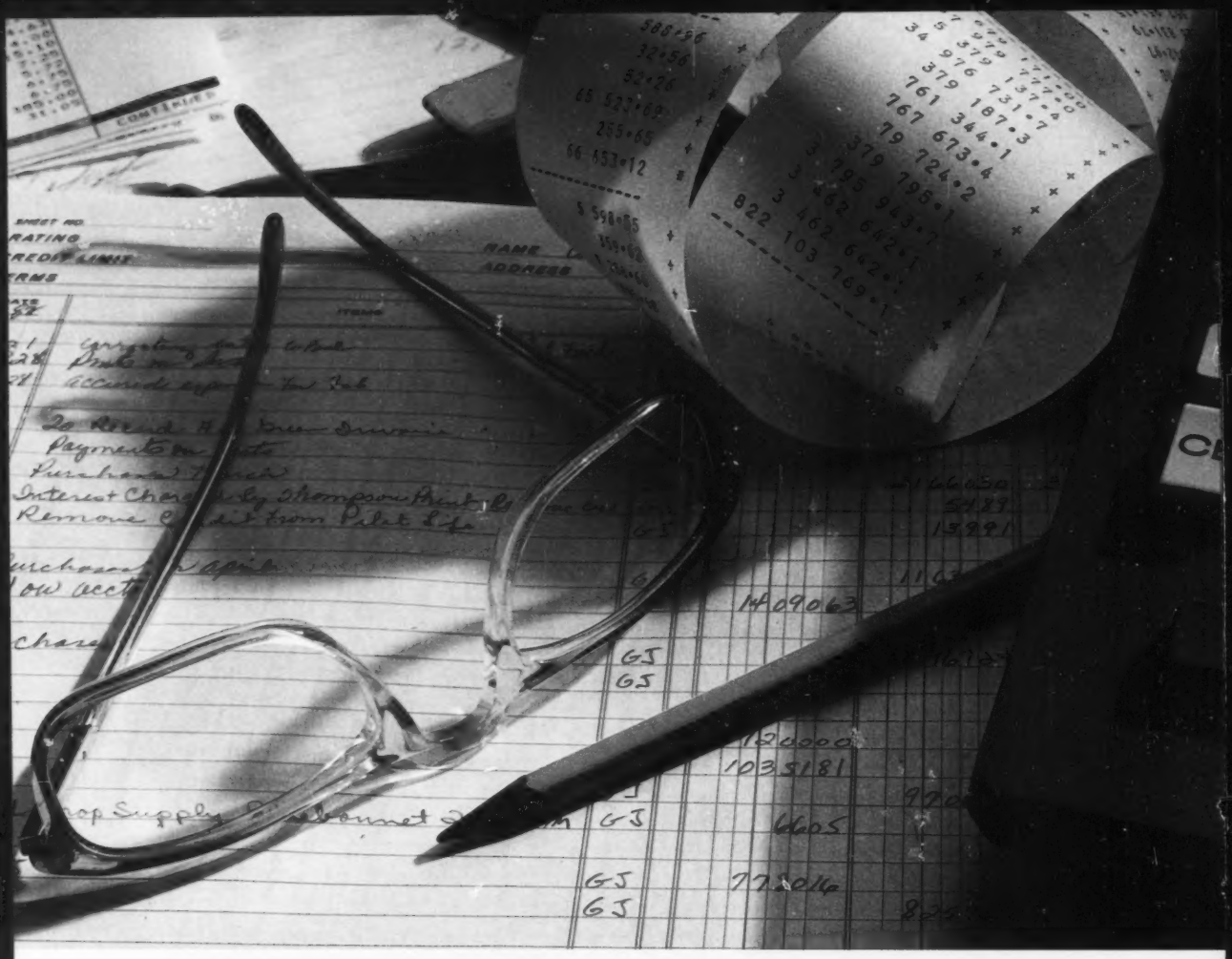

IF YOU WANT TO KEEP YOUR BOTTOM LINE FISCALLY FIT, TRIM YOUR OPERATING COSTS WITH AN AXE.

Let's face it. Most switching systems require a substantial investment just for routine operation and maintenance. And aside from cost, there are times when you simply don't have the manpower available to do these jobs.

That's why we designed our AXE digital network switching system with true modularity.

Modularity in the AXE represents an effective and convenient division of functions into autonomous software and hardware modules. It allows you to change a component part of the whole without changing the entire system.

Operationally speaking, AXE takes care of itself. Through a computer-based control and surveillance subsystem, it reports on its own health. And it regularly updates you on its performance.

If something minor goes wrong, it records what the problem is and where it is, then automatically reroutes traffic until the problem can be corrected. The system only alarms when a serious service degradation is likely to occur unless action is taken.

And since operations and surveillance functions can be carried out at a location remote from the wire center, you can use your staff more efficiently by organizing work on a network basis.

The theory behind the AXE is the less humans have to go inside the switch, the better it is for both you and your network.

In fact, it's been said that the ideal operation and maintenance crew for an AXE is a dog and a man. The dog's role is to keep the man away from the AXE. And the man's role is to feed the dog.

The point is, we know there's no room for downtime with your central office switch. That's why our processors, APZ-211 (for small- to medium-sized networks) and APZ-212 (for large metropolitan applications) have been designed with such care that

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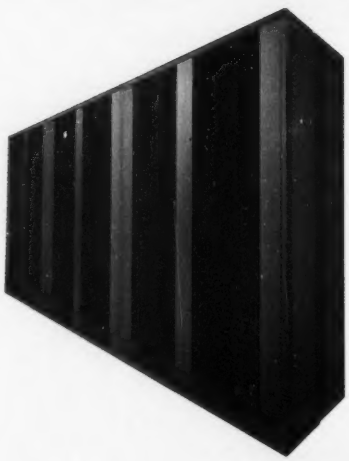


they have raised the MTBSF (Mean Time Between System Failure) to the incredible level of 1000 years.

But enabling you to reduce costs in the overhead area of operation and maintenance is only the beginning.

AXE's modular architecture also allows you to add revenue-generating services like call waiting, call forwarding, speed dialing, etc., quickly and easily – without reprogramming your generic software or changing hardware. It's as simple as plugging in a module.

What's more, we offer you the added security of a 24-hour, toll-free hotline for troubleshooting and parts from our Richardson facility. We can have service and parts on their way to you anywhere in the U.S. in a matter of minutes. But you'll find that most repairs require only minor adjustments performed by operating personnel who have been trained by Ericsson.

All things considered, isn't it about time you took an AXE to your bottom line? For more information, call 1-800-251-1126. In Texas, call 1-800-441-0036. Or write Ericsson Development and Support Center, 730 International Parkway, Richardson, Texas 75081.

Check No. 27 on Reader Service Card

ERICSSON

8800 comes in two models: the 8814 has two host ports and 6 to 12 terminals; the 8830 has two or four host ports and 8 to 28 terminal ports. *Kaufman Data Communications Inc.*

Reader Service Card No. 223

COAXIALS/This broad line of Comm/Scope Network Coaxials will be shown

for computer, telecommunications, plenum, industrial and military applications. Included are 50, 75 and 93 ohm cables, triaxials, special application coaxials and high performance trunk coaxials. *M/A-Com Cable Home Group*

Reader Service Card No. 224

DATA NETWORK MANAGER/The CP9000 Series II is a total network system for packet switching data networking that provides CCITT standard X.25 interfaces and X.75 gateways, as well as X.121 addressing and closed user group facilities.

The network supports terrestrial and satellite transmission links and combines fully distributed control bases with a centralized operational site. This allows for unlimited network growth, load sharing of key functions and automatic protection from component failure. The three main components in the network are the Network Operator Console, which employs an intelligent programable workstation; the Network Control System; and the Network Switching Nodes. *M/A-Com DCC Inc.*

Reader Service Card No. 225

DATA CONTROL SYSTEM/The SP/8564 is a CCITT X.25-based mininode or data traffic control system that operates at speeds up to 64 kb/s and provides a user-transparent interface to attached X.25 devices. Features include advanced information routing, load sharing and statistics capabilities. Overall throughput capabilities surpass 400 kb/s. The SP/8564 will support applications such as electronic mail, communicating word processors, teletext, videotex, and electronic file transfer at the local and wide area net-

work levels. *Memotec Data Inc.*

Reader Service Card No. 226

DATA LINE MONITOR/The Metascope Plus is a portable data line monitor and an Apple-compatible personal computer with dual disk drives and a package of four applications programs including

spreadsheet and a word processor. Data line monitoring functions include asynchronous and synchronous modes at speeds up to 19.2 kb/s. Display formats include ASCII, EBCDIC, Hexadecimal and Baudot. Other features include 12 K capture buffer, simulation capability, non-real-time saving of capture buffer to disk, saving of configurations on disk, routine to dump data file to a printer, and a powerful trigger capability. *Metatek Inc.*

Reader Service Card No. 227

DATA COMMUNICATIONS ANALYZER/Datatest II Plus data communications analyzer offers all the capabilities of the Datatest II plus a more powerful polling function that permits handling of multiple types of responses from up to 32 stations. For each station, the unit counts good responses, bad responses, un-

matched responses, communication errors, and timeouts. In addition, the data buffer has been increased to 4 K and 16 user messages can be stored, with a separate user buffer of 1 K. Also new is a real time interactive keyboard, CRC/FCS generation and checking, user definable flow control, improved terminal/printer testing function and six displayable data codes. *Navtel*

Reader Service Card No. 228

NETWORK MANAGER/The Integrated Digital Network Exchange (IDNX) is a T1 transmission resource manager for integrated corporate backbone networks. IDNX will support all network topologies. Features include dynamic bandwidth allocation, voice compression, alternate routing of calls when trunk failures occur, automatic switchover to redundant hardware if failure occurs, compatibility with AT&T T1 offerings and consistency with CCITT recommendations for ISDN. *Network Equipment Technologies*

Reader Service Card No. 229

DIGITAL KEY SYSTEM/The Premier 1648 is designed for the needs of medium to large businesses and can be expanded to a maximum of 16 CO lines and 48 stations. System program changes can be made without interrupting normal

communications, and by using an optional card, CO lines can be automatically connected to predesignated stations in the event of ac power/battery or CPU failure. Other optional equipment includes up to two DSS consoles with paging, call accounting, CO transfers and night service attendant override feature keys. A 29-character dot matrix miniprinter provides hard copy printouts to display and record database information. *NorthCom*

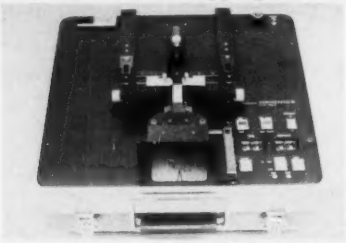
Reader Service Card No. 230

MULTIPLEXER/The Model 5200-16 is a high performance time division multiplexer that uses the data capacity of fiber optics to provide full service interconnect for 64-RS232. It will serivce 64 asynchronous data terminal equipment at 9600 baud or 64 synchronous data terminal equipment at switch selectable rates to 19.2 K baud. The composite optical stream is 9.8 Mb/s and can operate over 3 km of dual fiber cable without repeaters. *Optelecom*

Reader Service Card No. 231

OPTICAL FIBER SPLICER/Model FW-304 single-mode fusion splicer produces an average splice loss of as little as 0.15 dB or less using a wide variety of manufacturer's fiber. Model FW-304 has a 60X viewscreen for a sharp view of the

splicing process and uses high frequency ac arc to provide the uniform heat source necessary for low loss splicing and low



field maintenance. A high resolution XYZ positioner aligns fibers to better than 1/100th of a core diameter. *Orionics*

Reader Service Card No. 232

VIDEO NETWORK/The Private Satellite Network (PSN) is a point-to-multipoint video networking service that allows customers to transmit full motion, high quality color video signals via Ku band satellite directly from their company headquarters. No special videoconferencing facilities are needed. Small satellite receiver antennas are installed at any location in the continental United States. PSN provides total project management, installation and full maintenance, and consulting and production assistance. *Private Satellite Network Inc.*

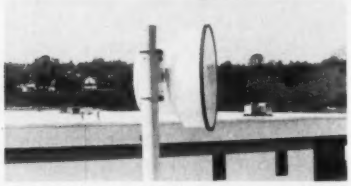
Reader Service Card No. 233

NETWORK MANAGER/The Communications Management Series (CMS) network management system is designed to provide complete central-site network

diagnostic/management control for large and geographically dispersed user networks. CMS systems are transparent to the main channel data of the information processing systems they support, and can communicate with central-site and remote equipment such as modems and switching devices. They perform testing and control, database management, file organization and performance reporting. *Racal-Milgo*

Reader Service Card No. 234

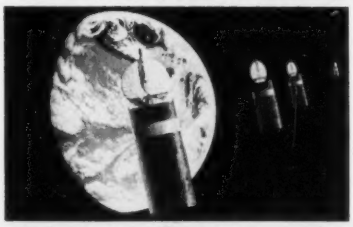
MICROWAVE SYSTEM/The Micropass III is a digital FM microwave system that



operates in the 23 GHz frequency band. The system permits wireless transmission of T-carrier signals, meeting the need for intracity communications. *Racon Inc.*

Reader Service Card No. 235

SATELLITE SERVICE/Satellite Business Systems provides a broad range



of voice, data and image telecommunications services such as long distance, WATS, FX, toll-free service and network service, INTERLINK, videolink, dataLine, RealCom and communications network service. *Satellite Business Systems*

Reader Service Card No. 236

NETWORK SERVICES/Spectrum Planning provides a full range of services for the design of satellite-based networks and the associated microwave interconnects. A total design package including site selection, frequency coordination, FCC filings and equipment specifications can be provided. Networks ranging in size from a single microwave link to hundreds of earth stations can be designed to meet the technical requirements and cost constraints of present and future communication needs. *Spectrum Planning Inc.*

Reader Service Card No. 237

LONG DISTANCE SERVICE/Starcall Metered Services provides total call completion for all U.S. mainland cities, Hawaii, Alaska, Puerto Rico and the U.S. Virgin Islands. Starcall services have been enhanced by providing regional calling rates, where customers can call other cities close to their own at special rates, in addition to the competitive rates customers receive when calling to any of the more than 1500 on-net Starnet communities. Starnet will offer free calls home for show attendees who stop by the booth. *Starnet Corp.*

Reader Service Card No. 238

CALL MANAGEMENT SYSTEM/The TBS/850 Call Management System

automatically dials from database information, recognizing all possible responses including busy signals, unanswered calls, hang-ups and recorded messages. Only answered calls are sent to the workstation where proper account data are displayed on a screen. Calls with busy signals are automatically called back in minutes and nonanswers are put back in queue for recall. This system can initiate 450 or more calls per hour and provides full reports of all activity. *TBS International Inc.*

Reader Service Card No. 239

SECURITY SYSTEM/The Cipher X 5000 Digital Communications Security System protects sensitive and valuable information from disclosure by rendering it unintelligible to unauthorized parties. Designed to meet FED-STD-1027, the

Cipher X 5000 system incorporates the National Bureau of Standards Data Encryption Standard algorithm, and features a flexible, highly secure key-management system. Capable of accommodating multiple key management techniques, the system secures dedicated and dial-up, point-to-point and multidrop networks in virtually any configuration. *Technical Communications Corp.*

Reader Service Card No. 240

PROTOCOL TESTER/The Chameleon II data communications protocol simulator/analyzer can be used for initial software module design through integration, regression testing, beta testing, pro-

duction, quality analysis, manufacturing, field support and data network monitoring. It uses a real time clock board to provide timestamping with millisecond accuracy in analysis, trace and simulation. The new software programs are Synchronous Data Link Control Statistics, X.25 Statistics and Direct-to-Disk Analysis. *Tekelec Inc.*

Reader Service Card No. 241

RECORDER-POLLER/The TRU System is an SMDR recorder and poller for any electronic PBX using IBM PCs. The TRU is also an applications processor with full V&H cost allocation, traffic statistics, optimization and directory. It can serve as an SMDR data collector and poller, transferring its data to a mainframe computer for processing, or the data can

Continued on page 82

Globecom '84 looks at communications in the information age

SANDRA WILLIAMSON, TECHNICAL EDITOR, and DEL MYERS, EDITOR

ONE OF THE clearest trends today is that telecommunications networks are tending to become aspects of information processing systems. As the importance—and demand—for information exchange and flow increases, the emphasis on communications systems also will increase in scope and importance.

A forum to explore various aspects of communications in the information age was provided at Globecom '84, the IEEE Global Telecommunications Conference held in Atlanta Nov. 26-29.

The annual meeting, sponsored jointly by the Institute of Electrical and Electronics Engineers (IEEE) Communication Society and its Atlanta Section, attracted more than 1650 scientists, engineers and industry specialists from around the world. This was a new record that topped last year's Globecom attendance by more than 400 participants.

The topic of international standards in the information age was covered early on when Richard S. Kirby, director of the International Radio Consultative Committee, addressed the opening plenary session.

He noted that today's telecommunications standards are rapidly becoming a subset of information processing standards. "The future growth of systems and services to deliver the benefits of the Information Age," he observed, "will require distributed processing, which will depend on standards for terminals to networks, network to network, and network to information processing." Networks are evolving toward wholly digital systems and packet switching. New and diverse services and operating entities are beginning to make up networks, and a variety of new transmission media are being exploited.

The practice of end-to-end standardization for particular services or systems in telecommunication and information processing, he said, is giving way to the standardization of functions and interfaces that can accommodate many end-to-end services. Open, modular and widely disseminated standards are necessary. He outlined briefly the scope of current international standards in telecommunications and the activities and concerns of relevant international organizations.

"The Open System Interconnection (OSI) and Integrated Services Digital Network (ISDN) concepts," he said, "represent remarkable progress, but much remains to be done. International arrangements need to be examined for possible better adaption to the new environment."

This was illustrated at the ISDN panel, one of the group sessions that immediately followed Kirby's speech.

If standing-room-only is an accurate barometer, interest in the ISDN is heading toward new highs. The panel, chaired by E. V. Farinholt of Satellite Business Systems, included A. C. McQuaide Jr., of AT&T Communications; R. J. Holleman, IBM; R. Albers, Bell Atlantic; S. S. Tiwari, SBS; P. Turner, Bell-Northern Research and M. Marcus, Federal Communications Commission Common Carrier Bureau.

Arno A. Penzias of AT&T Bell Labs was the keynote speaker at the conference banquet.

The affiliation of the panel members alone illustrates that realization of the ISDN in the U.S. is more elusive than in countries with a national telecommunications administration (PTT). The panelists, who disagreed on many points, unanimously agreed that ISDN, like beauty, owes much to the eye of the beholder.

Marcus, for example, explained that the "FCC does not wish to interfere with the internal, national policies of other governments" but admitted that it "thinks of the ISDN as one thing while foreign PTTs think of another."

The FCC also intends to preserve the existence of private lines, Marcus said, as a "competitor" of the ISDN, a position completely foreign to the PTTs and to the views of many U.S. network providers.

The panel, although the reluctance of some members could not be disguised, faced up to the reality that the integration contemplated in the ISDN requires standards and places heavy demands for cooperation upon competitors who furnish its various elements. And concerning standards, Marcus admitted that the FCC was a little "shaky" on its decision that the network channel termination equipment (NCTE) was part of the CPE instead of the network. (John C. McDonald, vice president and chief scientist of Contel, challenged this decision in a TELEPHONY editorial, Dec. 3, 1984, p. 47.)

Globecom '84 was the first IEEE

Communications Society conference to feature "minithemes" which include a tutorial, a series of technical sessions and a panel discussion. This conference included two minithemes, one on optical communications and the other on quality assurance. Optical communications, which includes but is not limited to the lightguide itself, currently is one of the hottest telecommunications topics in the world. Quality assurance, although important, is not. And this minitheme quite openly was an attempt to generate some heat and, perhaps, light on an esoteric and not especially glamorous subject.

"The IEEE Communications Society," Gordon Ray, Nynex vice president of planning, told TELEPHONY, "believes it essential for the telecommunications industry to have a means for the quality experts of the world to meet to advance the consciousness of communication engineers on the issues of quality in telecommunications products, networks and service."

To implement this belief, the Communications Society established the Quality Assurance Management Committee (QAMC) and the minitheme at Globecom '84 was QAMC's first public appearance.

"The divestiture," commented Fred Andrews, vice president-technology systems at Bell Communications Research, "has added further emphasis to elevating quality assurance activities. . . ." According to Andrews, each regional Bell company independently must become an expert buyer in a highly competitive market. And, if they are to interact intelligently with their suppliers, they must know the best quality assurance management practices.

During the technical session, Ray described his company's commitment to quality service leadership as the concept that marketing managers historically have chosen in preference to all other elements of marketability.

"We have determined," Ray said, "that the costs associated with ignoring quality are unaffordable."

Ray explained that assuring product quality before a product is installed in the network includes such means as the following: a vendor relations quality policy, quality program evaluations, multiple vendors, quality program specifications, tracking field performance and providing information to suppliers, audits of installed products and two-way communications between telephone companies and suppliers.

"In addition," Ray said, "Bell Communications Research, jointly owned by the seven regions, provides us with technical support. This assistance includes requirement definition, analysis and expertise in quality assurance. These quality services can range from a preliminary risk analysis through inspections of the final product."

The second minitheme, optical communications, covered a wide range of topics that reflected continuing interest in exploration of new or special applications of optical fibers in local networks, intercity transmission systems and switching.

Several sessions were devoted to emerging technologies in optical switching. S. D. Personick of Bell Communications Research identified three different applications for optic fibers in switching: automated (software controlled) optical cross connects, optical access multiplexers/demultiplexers, and all-optical circuit switches. Of these, he said, the latter is the most difficult to develop because it will depend on advances in highly functional integrated optic technology to produce practical cross-point arrays of large dimension and functions such as regeneration and synchronization. "In addition," he added, "an all-optical switch must compete on a practical economic basis with the alternative of an electronic switch." He predicted that it will not be practical or have an impact on network architecture within the next 10 years.

The feasibility of bistable laser diodes as optical switches and directional coupler switch matrices was explored in an optical time division digital switching system by H. Goto and colleagues from NEC Corp. The experimental 32 megabit per second system successfully was used to exchange four digitally encoded video signals with acceptable input and output loss margins.

The problem of unacceptably high dissipation with optical systems was covered by D. A. B. Miller of AT&T Bell Laboratories, who presented a high-speed optical modulator and an optical logic gate called SEED (self electro-optic effect device). The dissipation limits were significantly lower than those with previously demonstrated devices and the SEED was compatible with laser diode and semiconductor electronics. In Miller's opinion, the demonstration of the SEED shows that in principle, all-optical devices can now be made with good switching speed and very competitive switching energy.

Many other topics were covered in the remaining sessions. Of particular interest were sessions in large scale/very large scale integration-based subscriber transmission and customer access for ISDN that covered user-network interface circuits, circuit design and implementation; and sessions dedicated to technical preparations for the geostationary satellite orbit conference to be held in 1985 and 1988. The 1985 meeting will deal with which services and bands should be planned.

Another session focused on speech processing and on the projects under way for continuous speech recognition whereby a voice-actuated typewriter may be developed as part of an editing workstation.

A session on advances in communication terminals covered developmental projects in high quality facsimile transmission and full-color videotex. A series of sessions was devoted to the 32 kilobit per second ADPCM international coding standard and its successful performance testing and application in transmission test networks in eight countries, including the United States.

There were many more sessions too numerous to mention here. For those interested, the complete conference record with all papers presented in the technical sessions may be obtained by writing to the IEEE.

A summary of the thrust of Globecom '84 was provided by conference banquet speaker Arno A. Penzias, vice president for research at AT&T Bell Laboratories and a 1978 Nobel Prize winner, who discussed the impact of microprocessors, optical fibers and software development on the future of communications technology.

"The majority of what we do on this planet," he observed, "is to manipulate information." The trend is that communications are now becoming another, higher form of data processing. The growing problem will be that increasing amounts of data must be transmitted rapidly. The task for engineers will be to integrate modular systems and respond to needs for greater distribution access to data, which he maintained will be more challenging and harder to do.

The idea of "Communications Technology to Provide New Services" will be explored at Globecom '85, which will be held in New Orleans on Dec. 2-5 at the Hyatt Regency Hotel. □

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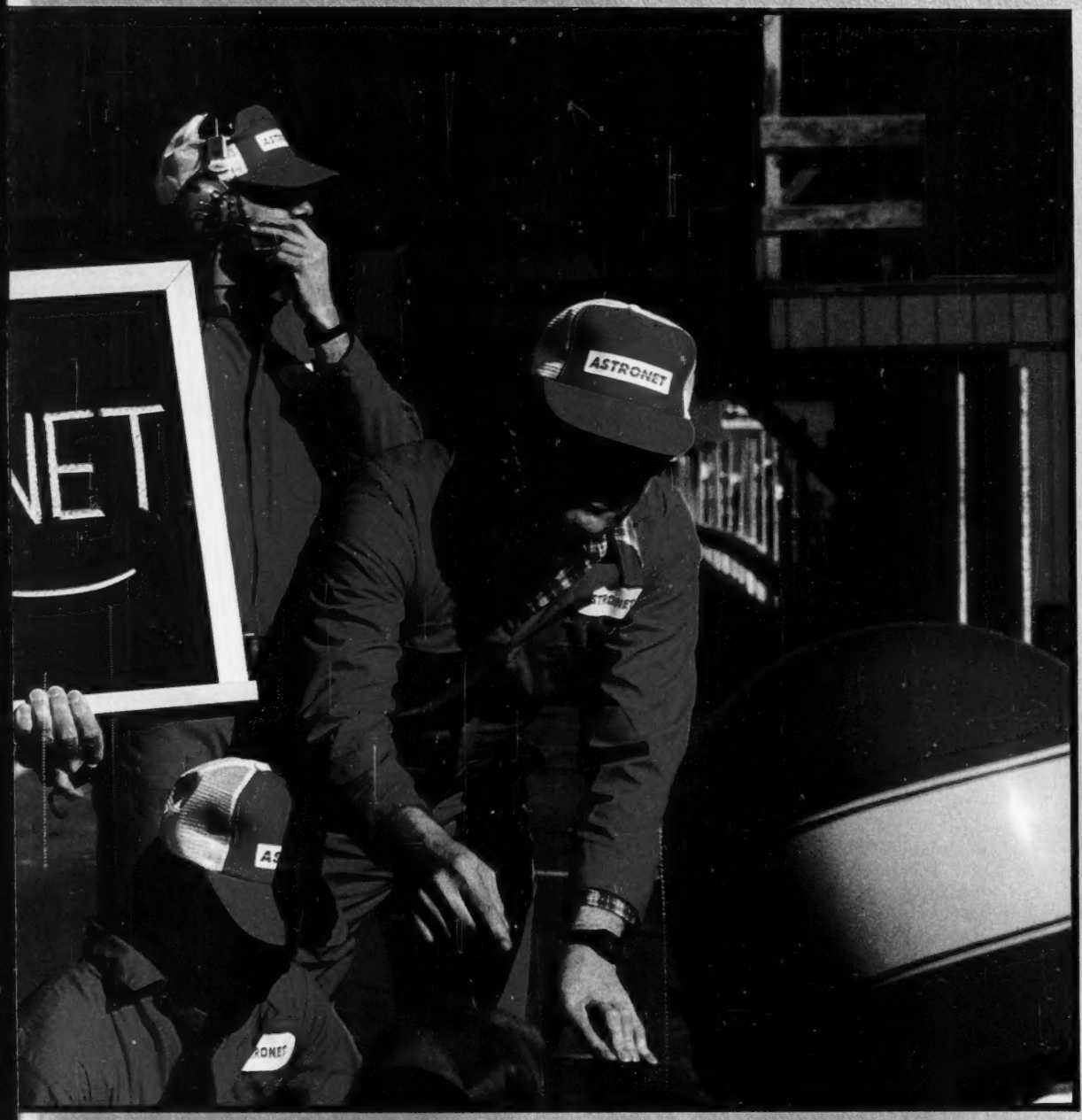

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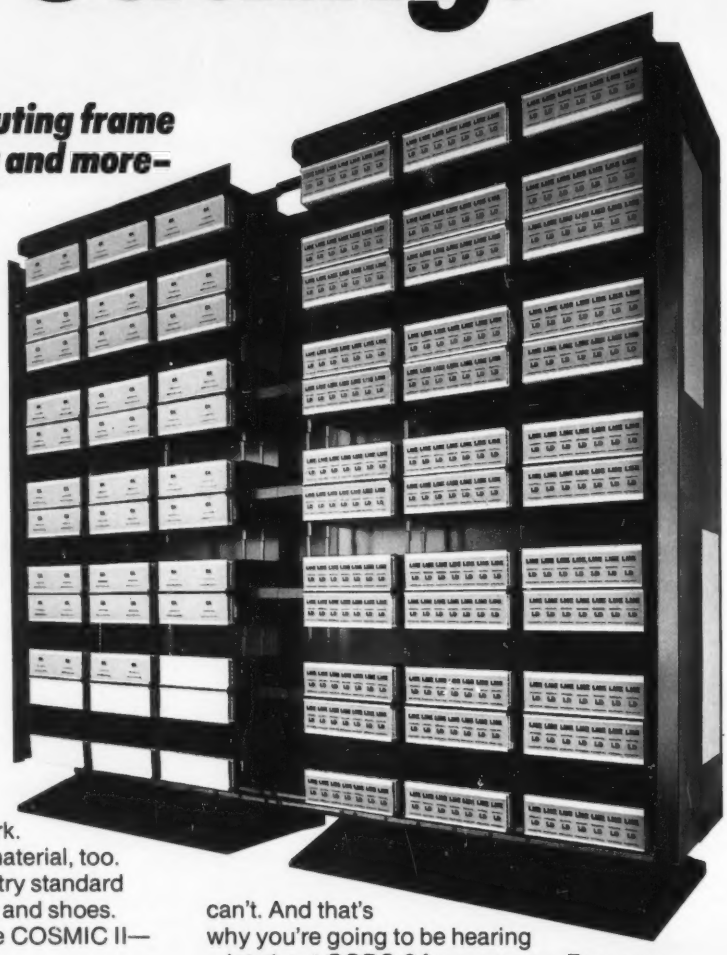

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NARUC continues the legend of public service regulation

PEGGY NELSON, ASSISTANT EDITOR

How public service regulators can make public utilities and carriers more responsive to the needs of the American people was the theme of the 96th annual convention of the National Assn. of Regulatory Commissioners (NARUC), held in Los Angeles Nov. 26-29.

The NARUC convention attracted approximately 1750 people, the largest crowd in the association's 96-year history. Last year's conference attracted approximately 1200 people.

The presentation of the many diverse panels began Monday afternoon. The telecommunications topics discussed throughout the four-day conference included: The March of Competition: Victory or Route?; Air, Communications, Energy and Transportation; Regulatory Reform—Consumer Information by Bill Inserts; Star Wars (The Advancing Technologies Driving Communication Policies); Workshop on Computers in the Regulatory Process; The Progress of Communications Competition: The Victors and The Victims (How May State Regulators Shape Events to Protect Local Ratepayers?); and, Access Charge Alternatives.

Two members of the Star Wars panel discussion were Alan G. Chynoweth of Bell Communications Research and D.J. Leonard of AT&T Bell Laboratories. Both speakers commented on the accelerating rate at which telecommunications technology is moving.

Chynoweth stated that "further technological progress is irresistible." He pointed out to the audience that many lifestyle changes have occurred because of advanced technology. Chynoweth went on to say that the future technological vision implies an era of the electronic cottage, electronic schools and telecommunicating to work; but in order to achieve this, there is a need for efficient, reliable, economical telecommunications networks.

Leonard also spoke of the beneficial impact which telecommunications technology has had on the general public and stated that "both the regulators and technologists have done well. Unfortunately, some of the new service benefits of technology recently have been denied or delayed." Leonard feels that it is necessary to "make clear the associated public benefits so that regulators may provide the conditions that allow technological innovation to flourish in the most efficient manner for the public good."

Philip R. O'Connor of the Illinois Commerce Commission, William C. McGowan of MCI Communications Corp., Alfred C. Partoll of AT&T Communications, and Robert H. Snedaker Jr. of United Telephone System comprised the panel on "The Progress of Communications Competition."

O'Connor began the panel discussion by stating that the "fundamental objective of state regulation is a least cost affordable telephone system which is designed to meet the needs of subscribers." He went on to list some key steps that can be used to prevent victims and protect ratepayers. These steps include deaveraging intraLATA toll rates; approving banded tariffs; using affiliated resellers; developing consistent prices and accelerating capital recovery.

McGowan, the next speaker to address the audience, began by presenting what he called a serious message: "Our national policy of moving toward a fully competitive telecommunications marketplace may be in serious danger in some states." He went on to say that "what is needed is an affirmation by the states that competition is a readily available and desirable mechanism for best serving the public interest." It is McGowan's opinion that such an affirmation on the part of the states does not mean regulatory abdication and that there is always enough flexibility to ensure

Continued on page 80

C&P Tel installs new credit card phone

RAY BLAIN
Senior Technical Editor

■ Using a credit card to pay for a phone call is not new. The Chesapeake & Potomac Telephone Co. (C&P) calling card has been a popular method of charging calls for a number of years. But what is new in the Washington area is a type of pay telephone that allows callers to use any one of five major credit cards to pay for their calls. And the new phone also allows customers to select which long distance company they wish to use—even if they do not have an account with the company.

C&P's new ChargeAll public phones are currently being installed at Washington's National Airport as well as at hotels in the Crystal City area. In all, 144 of the new telephones will be installed in this first phase of placement. Bell Atlantic is currently studying identical installations at airports and hotels in Pittsburgh, Philadelphia, Newark, N.J., Atlantic City, N.J., and Baltimore.

Judging from usage at the airport, the new phones are a hit. The caller simply draws his or her Visa, MasterCard, American Express, Diners' Club, or Carte Blanche card through the slot on the right side of the phone. Once the card number has been recorded and verified, the caller is told to select a long distance company by pushing one of the labeled buttons at the bottom of the phone. The caller is then instructed to dial the call in the normal fashion.

■ Telecom Canada has introduced a revolutionary new way for business people to keep in touch with their offices from major airports across Canada.

At a recent news conference, Telecom Canada spokesman Alan Walter, senior vice president, marketing, unveiled the first of 10 TelePort booths which are being installed in six airports across the country. Each Teleport is similar in appearance to a telephone booth. However, instead of just a telephone, each contains a terminal, a fully functional keyboard and an easy-to-read screen so that business people can access their electronic messages and search information databases. Each Teleport also includes a handset for Charge-A-Call phone calls.

Telecom Canada developed the TelePort booth to ensure that Envoy 100 and iNet 2000 subscribers can keep in touch with their offices. Envoy 100, Telecom Canada's public electronic messaging service permits the more than 15,000 subscribers to compose, edit, receive and store electronic messages to or from other subscribers or even to compose and send an EnvoyPost message—through Canada Post—to non-subscribers. iNet 2000 is Telecom Canada's information gateway service which provides a single point of access to information on most topics in hundreds of databases.

■ Behind the walls and below the floors of One Bell Center, Southwestern Bell's new headquarters building in downtown St. Louis, lies a super-highway of communication systems.

These systems will facilitate high speed communication for more than 2000 computer terminals, provide message service for approximately 4500 telephone desk sets and allow 45,000 pieces of mail to be circulated daily.

Although each system operates independently, the combined results will make One Bell Center a model of communication efficiency.

The main artery of the communication highway will be the more than 16 miles of fiber optic cable buried within the building. This is believed to be the largest fiber optic cable installation housed in one office building anywhere in the United States.

Initially, fiber optics only will be used for two purposes. The lightguide fibers will connect the computer terminals to main computers and to each other. The fibers will also be used for two-way video teleconferencing.

It is important to note that although fiber optics can be used for routine telephone operations, it was decided to continue to use copper wiring for telephone systems throughout the building. As a result, One Bell Center will continue to use Southwestern Bell Telephone's own Centrex telephone service along with the addition of many new electronic and state of the art features.

Cross Talk

In today's business world an executive knows something about everything; a technician everything about something; but the switchboard operator knows everything.

■ There have been changes in the way mobile telephone service is offered in Idaho, including deregulation of the service. Deregulation came about as a result of legislation enacted by the Idaho legislature in July 1983. The move was made due to increased competition for the market.

Mountain Bell has also restructured its rates to provide customers greater control over mobile service costs. There no longer will be a flat monthly charge and costs will be based on an exchange access fee, plus usage.

In addition to the service changes, mobile telephone users are being informed that their telephones will work on other public mobile radio systems throughout Mountain Bell's seven-state area as well as the remainder of the United States.

■ The Virgin Islands Telephone Corp. recently announced construction of a new $1 million switching center at Sion Farm, St. Croix. Company President Jack W. Basford said completion of the new switch is scheduled for early next year, and is intended to serve expanded digital service requirements for central St. Croix for the immediate future.

"The future of telephone is in digital switching," Basford emphasized, noting that advanced service offerings such as custom calling features and international direct dialing are now available throughout the Virgin Islands, in each of the company's six major exchanges.

■ The Wisconsin Public Service Commission (PSC) has reaffirmed its previous ruling, which allows local telephone companies to disconnect a customer's complete phone service if that customer's AT&T long distance bill has not been paid.

The original decision had been opposed by the Citizens' Utility Board. Because AT&T has no technology installed to block long distance calls for customers with unpaid bills, the local companies are allowed to disconnect all service.

The local telephone companies now handle the billing for AT&T, although AT&T has stated it is developing its own billing and collection service.

The PSC ruling will be reviewed in June 1987.

■ Nynex Business Information Systems Co. has signed a $4 million contract with Standard Telecommunications Equipment Inc., to buy and market the Marketphone. This is a computerized highly-flexible telephone specifically designed for the securities trading industry.

■ The Southeastern Wisconsin Area Agency on Aging—with a grant from Wisconsin Bell—has developed a 1-hour slide presentation aimed at answering questions faced by elderly telephone customers.

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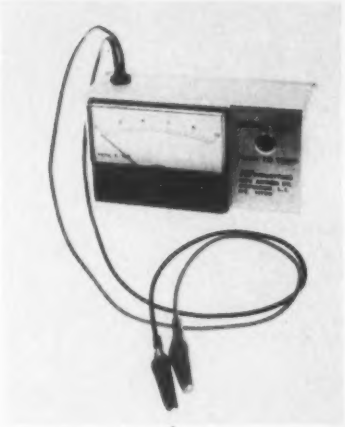

TESTER/This gas tube surge arrester tester, Model T 101, tests dc breakdown voltage of 2- and 3-electrode gas tubes. The tester incorporates a voltmeter, 2 alligator clip leads and a push-to-test button. Both open circuit and shorted tubes can be tested. *TII Industries, Inc.*

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DYNAMOMETER/This dynamometer is for measuring line tension when placing fiber optic cable. The running line may be connected or disconnected at any time, without unwinding to the end of the pulling line. The pull is stopped and the line is routed onto or off of the 4 sheaves of the dynamometer. The unit is intended for use in fiber optic cable pulling applications. *General Machine Products Co., Inc.*

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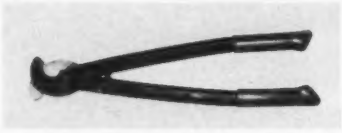

CABLE CUTTER/Model 63035 cable cutter is designed to cut up to 350 MCM soft copper and aluminum cable. The cutter has shear-type hook jaws that grab and hold cable to make clean, even cuts. *Klein Tools, Inc.*

Reader Service Card No. 172

JACK CONNECTOR/The R.J. Quick modular jack connector and cover provide 66 type termination of up to 4 modular jacks to a variety of cables for modular station connections. The connector can be mounted anywhere. *Proto-Tel*

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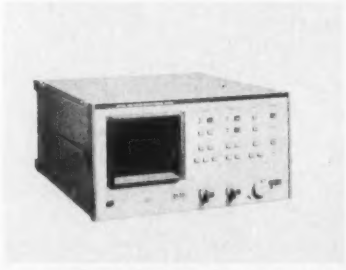

REFLECTOMETER/Model MW98A optical time domain reflectometer is for locating faults, evaluating splices and connections, and measuring optical losses in single mode and multimode fiber. The unit has pushbutton operation, a built-in microprocessor for processing and averaging and a shift function for zooming in on any selected observation point. Cable with refractive indices between 1.4 and 1.599 and lengths up to 72 km can be evaluated. The instrument is suitable for research and development, production, testing, installation and maintenance of optical fiber. *Anritsu America Inc.*

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CONVERTERS/The 700 series consists of 15 W to 50 W dc-dc converters designed to accept inputs ranging from 8 Vdc to 40 Vdc. Single outputs of 3 Vdc, 5 Vdc, 6 Vdc, 12 Vdc and 15 Vdc are offered. Output overvoltage and short circuit protection are standard on all models. *Power General, a subsidiary of Unitrode Corp.*

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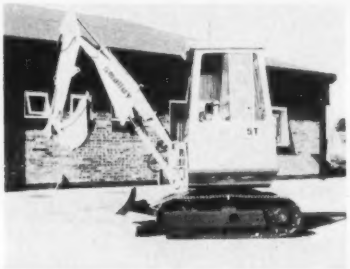

HYDRAULIC EXCAVATOR/The 5T hydraulic excavator has a tracked backhoe with 360° slewing capability, 5100 lbs. tear out force and maneuverability in restricted locations. The 5T has an offset feature and minimal overhang which allow it to dig within 8 in. of walls and obstructions and slew 180° to dump behind itself. *Smalley Excavators Inc.*

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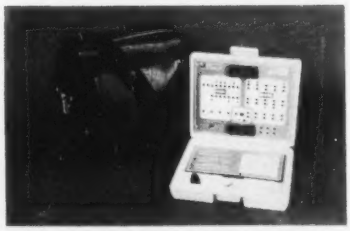

INTERFACE BREAKOUT PANEL/ Model 81 V.35 interface breakout panel is designed to monitor and breakout the standard 34-pin CCITT V.35 digital interface. The unit is for monitoring the modem/terminal interface, testing an iso-

Continued on page 68

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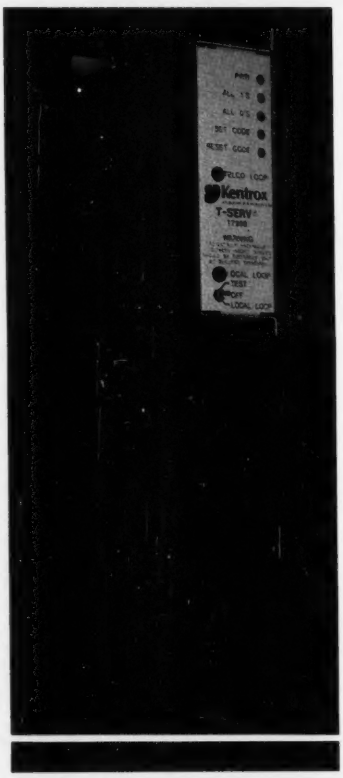

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lated modem or terminal and testing cables. All EIA RS-232-C control signals and CCITT V.35 clock and data signals are controlled by DIP switches which permit either a single or a pair of conductors to be opened. *International Data Sciences, Inc.*

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TELEPHONE EXTENDER ARM/ Model A is a hospital grade extender with a lock and key to prevent theft or breakage. Model B is designed for smaller type phones. The extension arm can be mounted on a bedpost, wall, windowsill or desk and snapped or locked on to the telephone. *Telephone Extension Corp.*

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SILICON RECTIFIERS/Models 1N 4001, 1N 4007 are 1 amp, and 1N 5400 and 1N 5408 are 3 amp silicon rectifiers. The units are designed for use in all types of electronic equipment, including rectifier systems, power supplies, telephone switching equipment and computer systems. They can be used in the 10 Ma to 6 amp rectifier diode range. *American Microsemiconductor Inc.*

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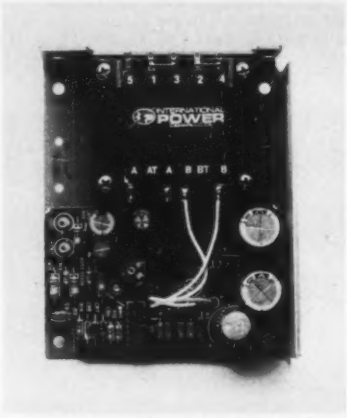

LINEAR POWER SUPPLIES/This series of 48 Vdc linear power supplies has enclosed primary and secondary coils and accepts inputs of 100/120/220/230-240 Vac. Sizes range from 48 Vdc at 0.5 A to line cord, fuse holder and pem nuts. *International Power*

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ELECTRONIC TELEPHONE/The Delphi 6 is a programable electronic telephone system. The system fits into a small office as a stand-alone key system and is also PBX compatible so it may be used in a large company having switchboard capability. Each extension can support 6 phone numbers programed into its memory for speed dialing. *FirsTel Information Systems, Inc.*

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ANALOG CARD/This analog card provides telemetering on the Raru remote alarm reporting unit system. Slave units can each transmit data from up to 16 circuits linked to variable output sensors to check battery condition, temperature and humidity. The system is for use in central offices, on fiber optic and microwave networks. *Positron Industries Inc.*

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FLAT CABLE SHIELD/The Cho-Jac flat cable shield is designed to attenuate RF signals and bring digital electronic devices into compliance with FCC and VDE radiation limits. The shield has a 360° metal foil shield and a bonded metal over-

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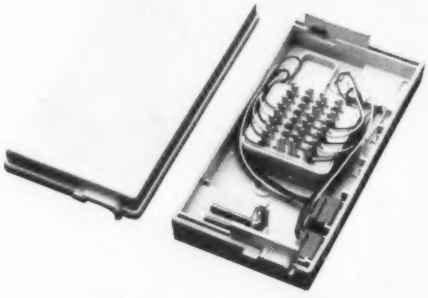

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lap which provides up to 65 dB of shielding when properly sealed and terminated. *Chomerics, Inc.*

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POWER MONITOR/This power line monitor has user-adjustable disturbance thresholds, detailed printouts of disturbance values, summary reports of disturbance activity to monitor ambient temperatures and dc voltage levels. The monitor is designed to allow continuous, unattended analysis of line power quality at potential electronic installation sites, or to check existing installations to determine whether electronic malfunctions are being caused by incoming dirty power. *Sola Electric, a unit of General Signal*

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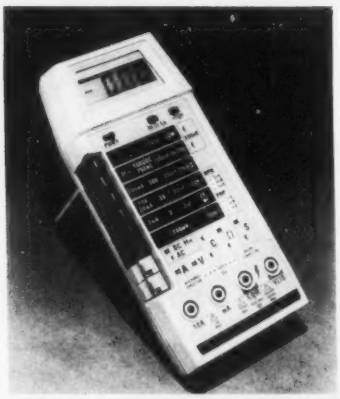

DIGITAL MULTIMETER/Model 7101 digital multimeter can measure dc voltage, ac voltage, dc current and ac current. The unit also checks resistance, diode test, high speed audible and visual conductance, logic level, hFE test and capacitance. *Spanta Inc.*

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CONVERTER/The TS-1 loop to ground start converter is used in conjunc-

Continued on page 72

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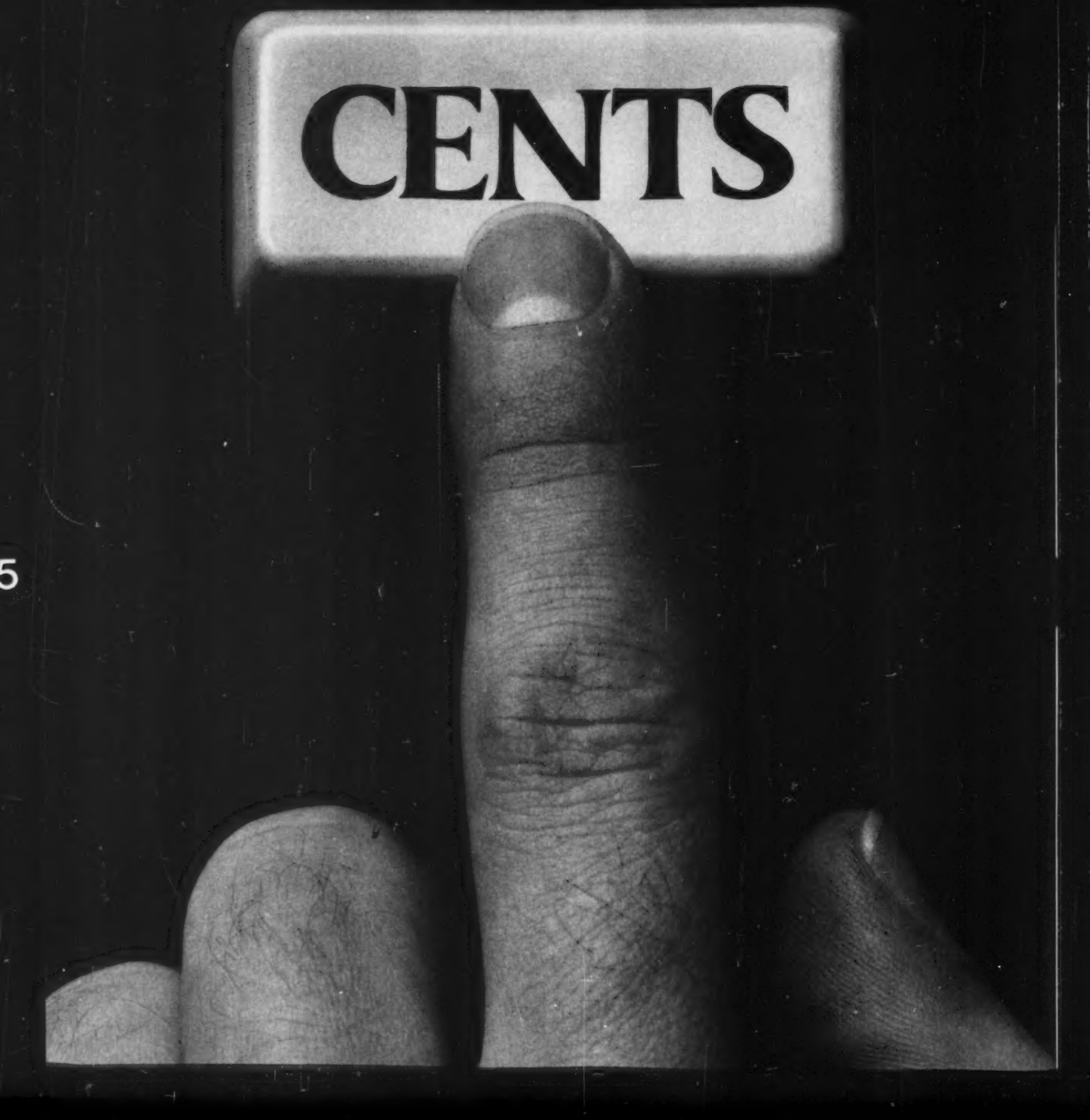

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Your problem: a huge and ever-growing mountain of billing, traffic and maintenance data which must be rounded up for processing from several remote, often unattended sites. And frequently, a grab-bag assortment of hardware and software to complicate your problem.

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One key to CENTS' performance is its extremely flexible interface capability. Data from different sources—electro-mechanical on up to digital—flows smoothly through CENTS, transforming your existing equipment into a compatible, end-to-end teleprocessing network.

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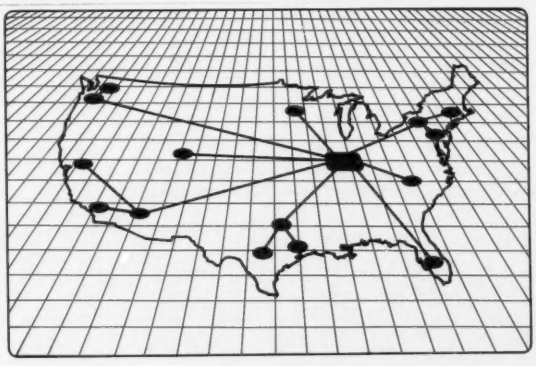

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Graham Langley's extensive experience in the telecom industry has included, since 1947, appointments with the Malayan Telecom Dept., the Singapore Telephone Board, Cable and Wireless and British Telecom Systems. He is currently with Mercury Communications, UK, and is the author of the widely acclaimed TELEPHONY'S DICTIONARY OF TELECOMMUNICATIONS.

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tion with PBX power failure transfer equipment. The converter is designed to allow standard telephone sets to be used with central office 2-wire ground start trunk lines. The converter provides the signaling required to draw dial tone from the CO trunk in the event of a power failure or system malfunction. *Gordon Kapes, Inc.*

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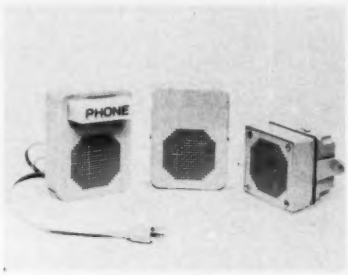

ELECTRONIC RINGERS/The TelHorn line of electronic ringers includes both indoor and outdoor models, with an optional 70,000 peak-candlepower strobe model for indoor operation. The units have built-in relays and ac line cord. *Wheelock Inc.*

Reader Service Card No. 187

SOFTWARE PACKAGE/This software package operates with Centrex software to provide personalized call answering and message waiting indication. The software eliminates the need for direct inward dial lines or a labor intensive message desk. Integration of the software with Centrex will make it possible for all Centrex users to record personalized greetings instructing callers to leave a message. The message waiting indicator notifies users of stored messages by way of a stutter dial tone. *VMX, Inc.*

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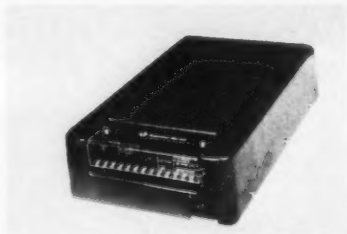

LINE VOLTAGE DETECTORS/The Remotector detector modules VMD400/VMD410 are portable multiphase/multichannel line voltage detectors. They can be temporarily or permanently installed remotely or adjacent to computers and other electronic equipment. The detectors identify and quantify incoming power line voltage aberrations. Information can be communicated directly for display on an ASCII terminal screen or PC equipped with an RS232C port configured in the standard 10-bit ASCII code. *Superior Electric Co.*

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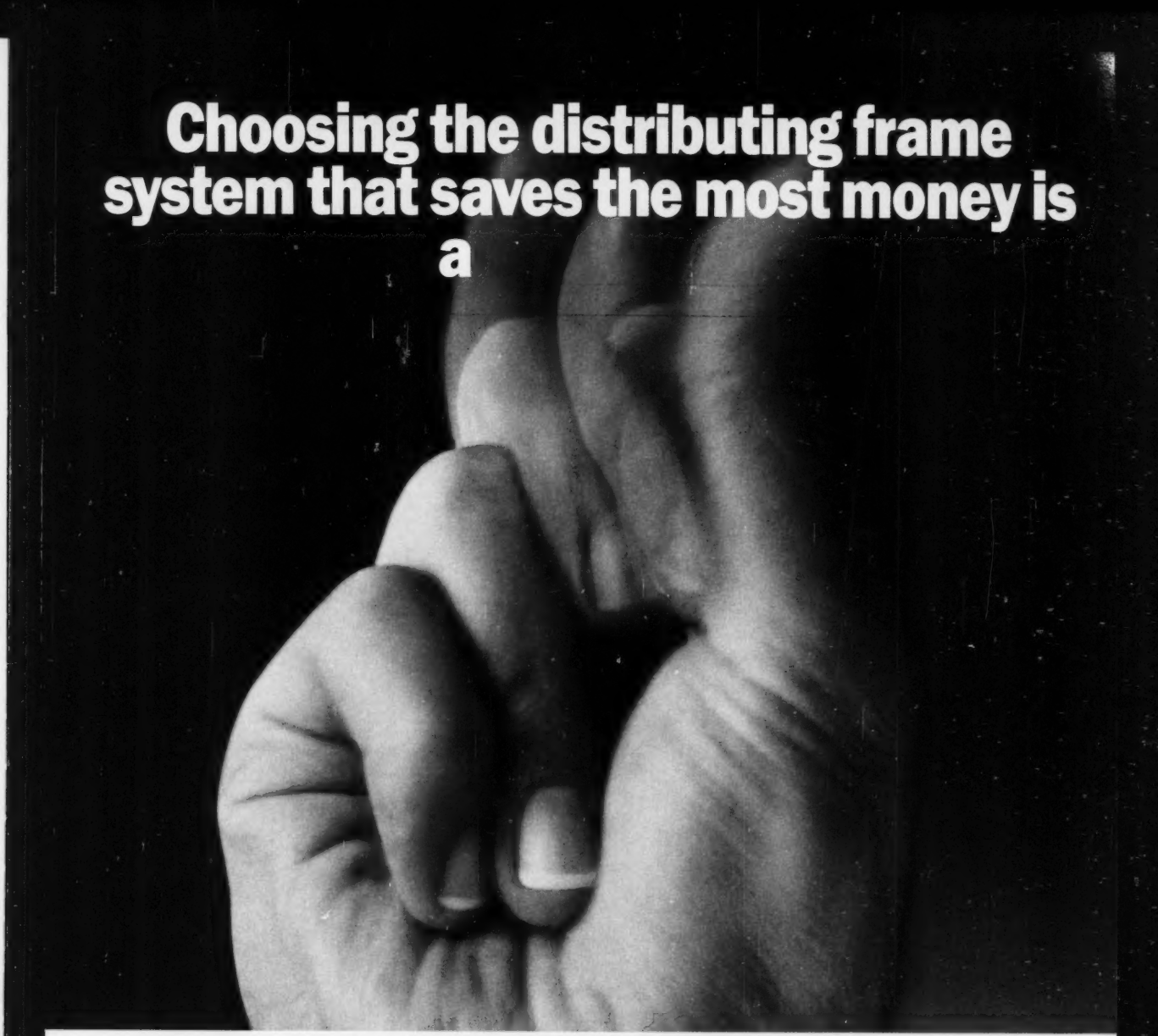
Choosing the distributing frame system that saves the most money is a



It's the COSMIC™ IIA Distributing Frame System (DFS) from AT&T Network Systems. And it makes saving money a snap.

Other distributing frame hardware may seem less costly. But none can equal the cost efficiencies or performance of our total system.

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The COSMIC IIA DFS. Just one of the flexible network systems from AT&T designed to cut your operating costs and enhance your revenue-generating capabilities. Nobody understands your business as well as we do. And nobody is as committed as AT&T to supporting your company in these uncertain times.

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The past: the answer to your troubles.

When a customer reports a problem, your answer clerk gets complete customer record data instantly, including station ownership facts and a history of prior repairs and service orders. Clerks can run an instant line diagnosis. Customers can be informed when repair is their responsibility. And problems your company must handle can usually be passed directly to dispatch, allowing you to use skilled testers more effectively.

The present: reduces "windshield time" with great dispatch.

Automatic dispatch priority management and geographic block control cut your dispatch driving time. By recognizing "common cause" trouble patterns, the system eliminates duplicate handling, duplicate dispatches. But most important, LRS-100 automation helps balance the bureau's workload and resource utilization for better management of your craft personnel, both inside and outside the repair service bureau. No paperwork. No confusion. Just swift, efficient service from trouble report to close.

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By controlling operating expenses, LRS-100 offers management some very important advantages in an increasingly competitive environment. Instant customer service facts and line diagnosis at first contact let you handle deregulation and benefit from its cost reduction opportunities. Everyone in the bureau works "smarter" because everyone has all the information needed about the work in progress. By compiling statistics automatically, LRS-100 gives managers the information they need to control the present and plan for the future.

Through the system's automated routining capability and our exclusive cable topology reports, you'll be able to spot problems before they develop, improving service and reducing costs through preventive maintenance.

LRS-100, the head of the family.

The LRS-100 is part of a modular family of automated systems for the repair service bureau. You can begin with our LRS-1 for automated testing, add the routining capabilities of LRS-10, and expand to a full paperless administration system with the LRS-100.

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Continued from page 13
tate closer linkages between Contel products and services.

A key part of this realignment will be the establishment of two new organizations, Contel Business Systems, Inc. and another sector which has not yet been named.

Contel Business Systems will supply office automation and voice/data systems, products and services to small- and medium-sized businesses. The unnamed business sector will provide customized telecommunications and information systems, including design, installation and maintenance to governments, large corporations and institutions. This group is essentially a merger of Contel Page, Contel Information Systems and the network marketing organization of Telephone Operations.

Wis. Bell must refund part of 1984 earnings

Wisconsin Bell, Inc. has been ordered by the Wisconsin Public Service Commission to refund approximately $23 million to its customers.

The order came after the commission monitored the utility's earnings since last May when the commission declared Wisconsin Bell's rates subject to refund. Commission auditors determined that the utility had been earning in excess of its 14.25% authorized return on common stock equity. Despite the refund order, the commission decided that customer rates for 1985 should remain the same, but are also subject to refund.

The refund order does not completely settle accounts over Wisconsin Bell's 1984 earnings. An additional $6.2 million is at issue in a federal court battle between the Public Service Commission and the Federal Communications Commission over depreciation methods, and $2.5 million in commissions paid to salespersons of Wisconsin Bell Communications is being investigated.

RCA Global to invest in PageAmerica

RCA Global Communications, Inc. and PageAmerica Group, Inc. have reached an agreement in principle pursuant to which RCA will make an equity investment in PageAmerica.

RCA initially will purchase $6 million worth of units from PageAmerica consisting of convertible preferred stock and warrants, and will be granted the right by the company and certain principal shareholders to acquire up to a majority of the voting stock of PageAmerica.

The transaction is subject to certain conditions including the execution of definitive agreements among RCA Global, PageAmerica and certain principal PageAmerica stockholders and to the appropriate board of directors approval.

RCA Global and PageAmerica Group are already partners in a joint venture, Radio PageAmerica, which is developing a worldwide paging, message and information network.

Illinois to change public utilities act

Illinois is working on a revised version of its public utilities act. A task force has been formed to design a replacement for the state's extant act—which will expire in this year.

The new revision, according to an Illinois Commerce Commission (ICC) spokesman, proposes that telecommunications should have its own statute completely separate from other energy utilities. The new bill must be passed by legislature and be ready for Gov. James Thompson's signature by October 1985.

A working model of the act must be ready by mid-February for review by the legislature. The spokesperson for the ICC also said that the committee working on the model is satisfied with the progress made so far and that the working model will be ready for review by the legislature.

Pacific Bell inks deal with Stanford

Pacific Bell will provide a 1.8-mile fiber optic trunk between Stanford University and the telco's central switching office in Palo Alto, Calif.

Under the terms of the contract, the fiber will carry telecommunications services between the public switched network and the university's digital telecommunications system connecting more than 250 buildings on the university's 8000-acre campus.

According to Bill McDonald, Pacific Bell's Stanford fiber project manager, the fiber link is the first major part of an end-to-end local digital fiber network that Pacific Bell is installing in the Silicon Valley/Palo Alto area to serve more than 100 businesses, government facilities and institutions.

The telco expects to replace the old copper wire transport system with fiber cable by June 1985. Stanford expects to have more than 15,000 voice lines in use by 1988-89, compared to the 12,000 in use at present. The university also expects to increase its data lines more than 125%—from 1500 to 3500 within the same time period.

TELEPHONY 'special' issues—call for articles

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Subject	Deadline
Local Distribution (Subscriber Loops and Bypass) Technologies and Applications	Jan 14
International Business Communications Preview: Asia Telecom 85 (Singapore) Preview: Communications London	Jan 28
Public Network Services For Business Communications Preview: ICA 85 (Dallas)	Feb 18
International	Feb 25
Outside Plant	Mar 4
Fiber Optic Technology and Applications	Mar 18

Obituary

Ron Frank, former editor of Computerworld, dies

Ronald A. Frank, managing director of Frank Communications Group and a former Computerworld editor, died in early December after an extended illness. He was 50 years old.

Mr. Frank joined Computerworld in July 1969 as a technical news editor. He left the newspaper as a senior editor/communications in September 1979. Before joining Computerworld, he had worked at Bendix Corp. and as a technical writer at Honeywell, Inc. Mr. Frank was also a member of the Institute of Electrical and Electronics Engineers, Inc.

Mr. Frank is survived by his wife and two children. Memorial contributions can be made to a scholarship fund being established by another of Mr. Frank's fellow ex-Computerworld editors, Vic Farmer.

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Continued from page 16
to implement the Reagan administration decision to open the door to international satellite systems outside the International Telecommunications Satellite Organization (INTELSAT) network (TELEPHONY, Dec. 10, 1984, p. 14). The commission has adopted a notice of inquiry and proposed rulemaking (CC Docket 84-1299) seeking comments on establishment of private systems.

In inviting comments on issues raised by the applications already on file at the commission—from Cygnus Satellite Corp., International Satellite, Inc., Orion Satellite Corp., Pan American Satellite Corp. and RCA American Communications, Inc.—the FCC said it is seeking information needed to assist it in considering a policy on alternative satellite systems providing international telecommunications services. It asked for comments by Feb. 14, with replies due by March 7.

The commission acted after receipt of a letter from the Depts. of State and Commerce outlining what they said are necessary criteria for ensuring attention to this country's international obligations and furthering its telecommunications and foreign policy interests. Those agencies propose imposition of two restrictions on alternative systems before they get final FCC authorization. These are that:

- Each system is to be restricted to provision of services through the sale or long term lease of transponders or space segment capacity for communications not interconnected with the public switched message networks, except for use in conjunction with emergency restoration; and
- One or more foreign authorities are to authorize use of each system and consult with the United States under the INTELSAT agreement to ensure technical compatibility and avoid significant economic harm.

Washington Round-Up

Cellular service: in Oxnard. . . The FCC has approved the application of the Oxnard-Ventura-Simi Ltd. Partnership for authority to establish a cellular mobile communications system in the Oxnard, Calif., standard metropolitan statistical area on frequency block B. Under a settlement agreement, Pactel Mobile Access will hold a 50% interest in the partnership and act as general partner. Minority interests will be held by Contel Mobilcom, Inc. (34%), United States Cellular Corp. (15%) and GTE Mobilnet Inc. (1%).

. . . and top 90 markets. With grant of a construction permit in Oxnard (see preceding item), the FCC reports that cellular carriers have been either licensed to operate or authorized to construct systems in all of the top 90 cellular markets. This process, which got underway in 1982 with the filing of applications for the top 30 markets, was accelerated as the result of settlements between applicants—particularly in markets 31-90 (TELEPHONY, Oct. 15, 1984, p. 13). Wireline carriers have been licensed to operate or authorized to construct in all top 90 markets, while non-wireline carriers have a license or authorization in 23 of the top 90 markets. The FCC said that as a result of settlement agreements, it expects that construction permits will be issued to non-wireline carriers in most of the remaining top 90 markets in the near future.

Lottery procedures. The FCC has issued a directive outlining procedures to be followed in the use of lotteries to select among competing applicants for specified types of service. The use of random selection by lottery was authorized by Congress in certain instances in the Communications Amendment Act of 1982. The "Lottery Processing Manual" issued by the FCC (Gen. Docket 81-768) supersedes an earlier directive, and provides guidelines to operating bureaus responsible for processing applications and to organizations that provide legal and administrative support to the lottery process.

International telegraph. Saying it sees no valid reason at this time "to take comprehensive regulatory action in the telegraph area," in part because of a reduced level of traffic, the FCC has vacated a rate prescription imposed in 1966 on RCA Global Communications' international telegraph rates that has served as a precedent for all carriers providing similar service. Acting in response to a rate increase filing by RCA Global, the commission said that telegraph service appears to be diminishing in light of the availability of new international telecommunications technologies and that "an 18-year-old rate prescription for international telegraph services may be stale and no longer appropriate." The FCC said it will allow RCA Global to file rates "at levels supported by current economic data" and in the future will "evaluate individual telegraph service tariff filings on their own merits."

Lotteries for private land mobile. . . The FCC has authorized the chief of the Private Radio Bureau to issue lottery orders in the private land mobile services. The commission acted in keeping with the 1983 rules amendment to allow the use of lotteries in place of comparative hearings when it determines this is the most efficient method of granting applications, and where there are no substantial material differences between applicants. The FCC said the use of lottery orders by the Private Radio Bureau will save over a month of processing time in the handling of applications.

. . .and specialized mobile radio. The FCC has decided to conduct lotteries to select licensees from among 451 competing applicants for specialized mobile radio 800 MHz channels in the Buffalo, N.Y., San Diego, Calif., and Los Angeles-San Francisco areas. The latter were consolidated because spacing rules preclude co-channel grants at proposed transmitter sites which are within 70 miles of each other.

"Call Prompter" tariff nixed. The FCC has rejected WATS revisions filed by AT&T (Tariff FCC 259) authorizing new 800 service features and making minor revisions to other existing 800 services. The commission's action was based on its conclusion that one of the new service fea-

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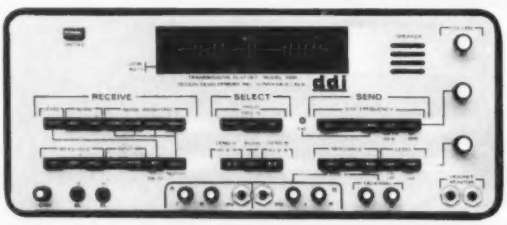

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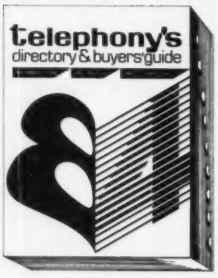
tures—Call Prompter—could encompass the provision of an enhanced service within the meaning of the Computer II decisions and that its offering under tariff would violate FCC's rules. In operation of Call Prompter, a network device intercepts an 800 call and presents a list of available services, with connection to the desired service made when the caller dials the appropriate code. The FCC said this appears to involve some interaction with stored voice information when implemented to provide "in network" call routing, with few controls to prevent subscribers from implementing call prompting to provide other services from the network in addition to call routing. The commission said that because the tariff invests much of the Call Prompter control service to subscribers, there are many situations where the services could be enhanced. Noting that the mere provision of a routing service could be desirable and might appropriately be tariffed, the FCC said AT&T might wish to revise its offering to take into account concerns about its "open-ended" nature.

Price policy complaints. The Consumer Federation of America (CFA), a grouping of over 200 consumer organizations, has issued a hard-hitting attack on telephone pricing policies. In a report titled "Divestiture: One Year Later," the organization says local telephone companies during 1984 asked for $10.9 billion in revenue increases, and were granted $5.1 billion; that residential rates during the year rose more than $2 billion, and that the average cost of flat-rate unlimited residential service jumped 19% (from $11.80 a month to $14.09). The study predicts that residential rate increases will cause more than 2 million people (750,000 households) "to do without a telephone by mid-1985" and that federal and likely state access charges will cause additional households to give up service by adding another $2-$4 billion onto the cost of local residential phone bills. Gene Kimmelman, CFA's legislative director, termed state-approved rate increases "unnecessary and inequitable." He said, "Phone industry pricing policies, not competition or the [AT&T] breakup itself, threaten universal phone service."

Access appeal. A growing number of individual state regulatory commissions are joining NARUC in asking the U.S. Supreme Court to overturn a decision by the U.S. Court of Appeals for the District of Columbia Circuit upholding the FCC's access charge plan (TELEPHONY, June 25, 1984, p. 16). NARUC in its petition for high court review of the decision said it touches on "the ability of the states to lawfully regulate intrastate communications in the public interest." This jurisidictional question is at the heart of appeals filed by the Public Utility Commissions of California, Florida and New York. While it also serves as the basis for similar appeals by the Michigan and Wisconsin regulatory commissions, they have gone a step further by claiming that divestiture of the Bell System requires a redefintion of "the jurisdictional limits between FCC authority and that of the states."

Cellular dumping. The International Trade Commission (ITC) in a preliminary decision has ruled that cellular telephones imported into the U.S. from Japan may be injuring domestic producers and may be subject to penalty duties. This decision clears the way for the Dept. of Commerce to continue to investigate charges by Motorola Corp. that Japanese firms have been selling cellular instruments in this country at unfairly low prices, a practice termed "dumping." The ITC said that about $85 million worth of cellular phones were imported into the U.S. from Japan during the first 9 months of 1984.

IBM gets Rolm O.K. Action by the Dept. of Justice (DOJ) has cleared the way for IBM's acquisition of Rolm Corp. on condition that the takeover not include Rolm's Mil-Spec division, which manufactures computers for military applications. The DOJ, which had sued to challenge the acquisition, submitted a proposed consent decree concerning the Mil-Spec spin-off to which the two companies agreed. The decree, subject to court approval, cleared the way for IBM to complete its acquisition of Rolm stock and of that firm's market share of business telephone switching equipment sales.



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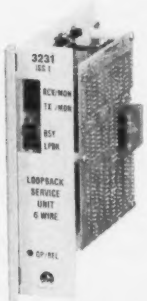

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- Tone reset or timeout

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Continued from page 63
that local situations can be accommodated.

"Still struggling with competition is delaying long distance customers from benefitting," said Partoll, the next speaker. He said that there are neither winners nor losers in the present situation. He also stated that it is good that federal and state regulators have come together to provide needed direction. Partoll is optimistic about the future of the industry and feels that finally the real issues are being discussed.

The final speaker for this panel was Snedaker, who believes that it is vital to "implement the transition to deregulation and competition in the innercity area to balance the need to maintain universal service." He also mentioned the unity position and said he considers it a major milestone for the industry. Another major milestone, according to Snedaker, was the agreement reached by the joint board providing for the implementation of a $1 customer line charge and an additional $1 charge to be implemented 1 year after. He concluded his presentation by saying that the industry achieved unity "through give and take, likewise the FCC [Federal Communications Commission] and the state commissions hammered out a joint board compromise that will be in the customers' best long and short term interests."

"Access Charges and Alternatives," the final telecommunications panel of the conference, featured Mark S. Fowler of the Federal Communications Commission, Marvin R. Weatherly of the Alaska Public Utilities Commission and Raymond W. Smith of Bell of Pennsylvania.

Fowler began the discussion by saying, "We must work together to solve probems brought about by technological change." He told the audience that universal service is imperative for the sake of the poorest people who "must not be left behind in the wake of the technological revolution." Fowler feels that in the past year the industry has learned: that the revolution must be harnessed; that gradualism has its place even in revolutionary times; that dialog can work only when both parties listen; and, that cooperation is necessary.

Weatherly told the audience, "Access charges were dropped on the nation as a response to bypass but they are only a partial answer." He pointed out that bypass is a local problem and not the same throughout the country. It is Weatherly's opinion that the FCC will not adequately address his needs nor the needs of the industry across the nation and that there is a need to get rid of the nonproductive bureaucratic nonsense.

Smith addressed only the non-traffic sensitive (NTS) access charges. He feels that there are only three groups who can pay access charges: the interexchange carriers, the government through a subsidy or the end user. After a lengthy explanation of why the first two groups should not pay, Smith stated that the end user should be the one to pay because this "would result in the lowest cost for residential customers in the long run—but not in the short run." He concluded by saying that he fully supports the FCC's plan for access and sees the joint board as only the first step.

After all had been said and done the attitude of the convention attendees seemed to be one of happiness at having survived divestiture and relief that the industry was moving on and addressing the issues which need to be addressed.

The 1985 NARUC convention will be held in New York Nov. 11-14. □

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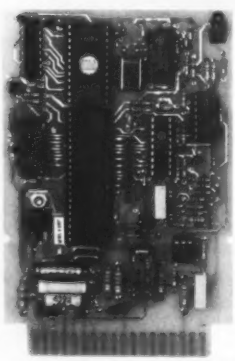

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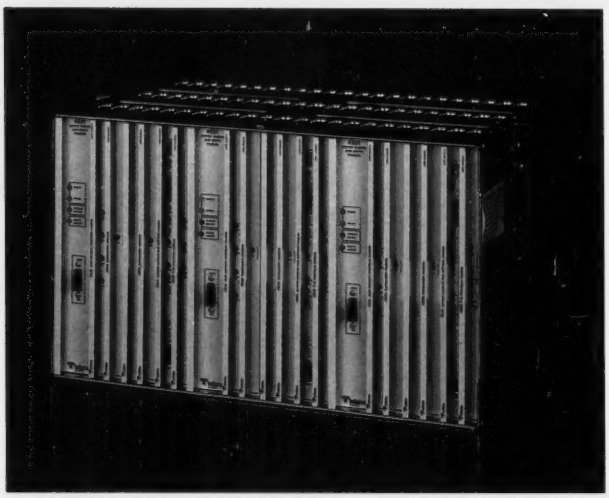

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Continued from page 57
be retained on the PC, turning the TRU system into a fully self-contained applica-

tions processor. One TRU can hold from 200,000 to 500,000 call records. Used as a self-contained applications processor, it can process up to 150,000 call records. *Telco Research Corp.*

Reader Service Card No. 241

INFORMATION SERVICE/TeleStrategies, a full-service information firm, specializes in market research, business development and strategic planning programs for the telecommunications and information processing industries. TeleStrategies produces seminars and executive-level conferences on new telecommunications technologies and business opportunities, and produces in-depth market reports and monthly newsletters. *TeleStrategies Inc.*

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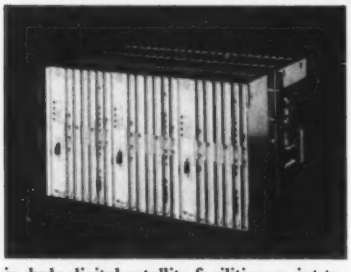
TRANSCODER/The 450 T-Coder allows two T1 digital carrier lines to share the allowable bandwidth of a single T1 link, thus reducing installation costs and monthly charges for T1 lines. Applications



include digital satellite facilities, point-to-point digital facilities and digital facilities terminating at customer premises where the customer controls the mutliplex equipment at both ends. One 450 T-Coder System is required at each end of a circuit. Each 450 System interfaces two non-synchronous T1 lines and transcodes the 8-bit mu-law format into 4-bit adaptive differential pulse code modulation code, thus allowing transmission of 48 voice channels on a single T1 line. *Tellabs Inc.*

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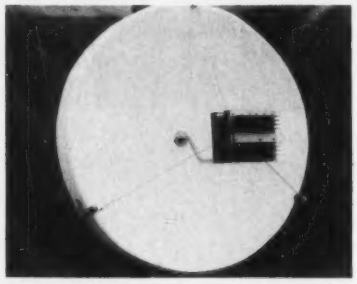
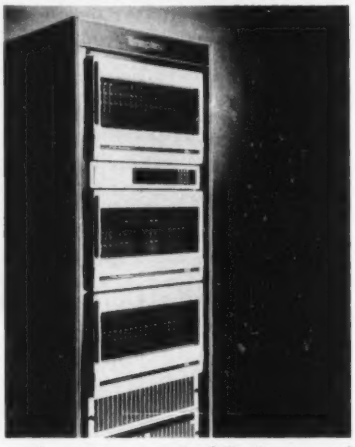
MICROWAVE RADIO/The Telsat radio is a full duplex 23-GHz microwave radio system intended for short hop transmissions. Designed specifically for the reliability and high speed data requirements of local area networks, the Telsat radio offers increased bandwidth for data rates up to 10 Mb/s. The range of the full duplex system is up to 5 miles in the highest rainfall areas in the United States. The RF head, consisting of the transmitter, re-



ceiver and demodulator, measures only 5 in. by 5 in. by 5 in. and is mounted at the focal point of the reflector. *Telsat Corp.*

Reader Service Card No. 244

FACILITIES MANAGEMENT SYSTEM/The Link/1 Facilities Management System for T1 rate transmission facilities is designed to allow communications net-



work managers to take full advantage of T1 rate facilities by allowing data, voice, digital video and facsimile to share the same network. Link/1 uses continuously variable slope, delta modulation at a standard rate of 32,000 b/s. At the standard rate, 24 digitized voice channels can be supported using only one half the available bandwidth, leaving the remainder of the T1 line available for simultaneous support of data and other digital services. *Timeplex Inc.*

Reader Service Card No. 245

LOCAL AREA NETWORK/Net/One is a group of general purpose local area networking products. The Personal Connection is a family of products that allows IBM PCs to be mixed cost effectively into a high speed, corporate network with devices from different manufacturers. Through the use of Net/One and Personal Connection software, PCs can access files and application programs from the shared hard disks on the network. PCs can also share expensive peripherals such as printers, or send memos and associated data files over the network to an individ-

ual, a list of individuals or a predetermined distribution list. *Ungermann-Bass Inc.*

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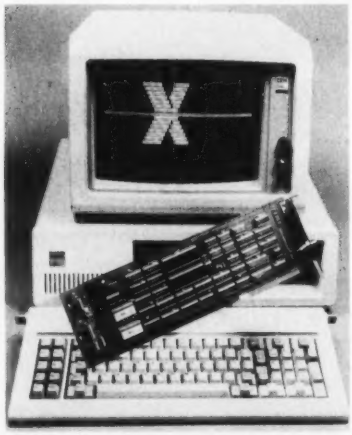
MANAGEMENT SYSTEM/The X-Tend CDR system is a stand alone microprocessor hardware and software system for communication management. It is designed for use with an IBM XT to monitor and control performance and cost of company telephone systems. It processes information provided by the PBX in real time and confirms that both PBX and CDR systems are functioning while also detecting and reporting errors. Detailed reports are generated from this information including phone cost allocation, departmental reports, traffic reports and account code reports. *X-Tend Communications Corp.*

Reader Service Card No. 247

INTERCONNECT PRODUCTS/The xyplex host interface unit (XP-3270) for IBM mainframes provides IBM 3270 protocol conversion for asynchronous



ASCII terminals connected to the Xyplex system. Up to seven terminals can be handled simultaneously. The Xyplex IBM PC Controller, XP-IPC, is a single standard size (13 in.) peripheral controller board that emulates the IBM RS 232 communications port to all software programs running on the IBM PC. The XP-IPC gives the IBM PC user the ability to access an IBM mainframe through the XP-3270 host interface unit as well as to emulate an IBM 3270 terminal. *Xyplex Inc.*

Reader Service Card No. 248

MOVING AROUND INDUSTRY

Siecor names two

Charles B. Wakeman has been named president and chief operating officer of Siecor Corp., Hickory, N.C. Joseph D. Hicks has been named senior vice president, sales and marketing. Wakeman was most recently vice president and general manager, optical cables and accessories. Hicks was formerly vice president and general manager of the computer and communications products group.

Toshiba promotes McDonald

Keith McDonald has been promoted to national sales manager of the MOS IC Div. of ECBS at Toshiba America, Inc., Tustin, Calif. McDonald will be responsible for field sales management, field sales representatives and the distributor network. He was previously Southwest area manager.

Blackman serves as director

R. Craig Blackman is currently associate professor and director of the Dept. of Telecommunications at Barry University, Miami Shores, Fla. Blackman was formerly program manager and senior consultant with the Telecommunications Industry Group, SRI International. He was also previously publisher of Telecommunications Magazine, and editor/publisher of Communicaciones magazine. He also founded the LatCom Consulting Group.

R.C. Blackman

M. Thomas

Telenova elects president

Telenova, Inc., Los Gatos, Calif., has elected M. Peter Thomas president and chief operating officer. Thomas will oversee the company's daily operations. He was formerly president of ITT Telecom Network Systems.

Cherry named CEO at Telcom Tech

Robert H. Cherry has been appointed chief operating officer at Telcom Technologies, Ontario, Calif. In his new position, Cherry will be responsible for the daily operations of the company. Cherry was previously with Master Specialties Products.

BBL promotes Saner

BBL Industries, Inc., Atlanta, has promoted Mike Saner to president and chief operating officer. Saner was executive vice president of sales and marketing for the company. BBL Industries manufactures paging terminals, mobile telephone terminals and voice messaging systems.

M. Saner

C. Gantz

Gantz joins Sidereal

Christopher C. Gantz has joined Sidereal Corp., Portland, Ore., as national distributor sales manager. He will be responsible for developing and refining a large scale program for sales of message communications terminals through distributors. Gantz previously held a similar position with Extel Corp.

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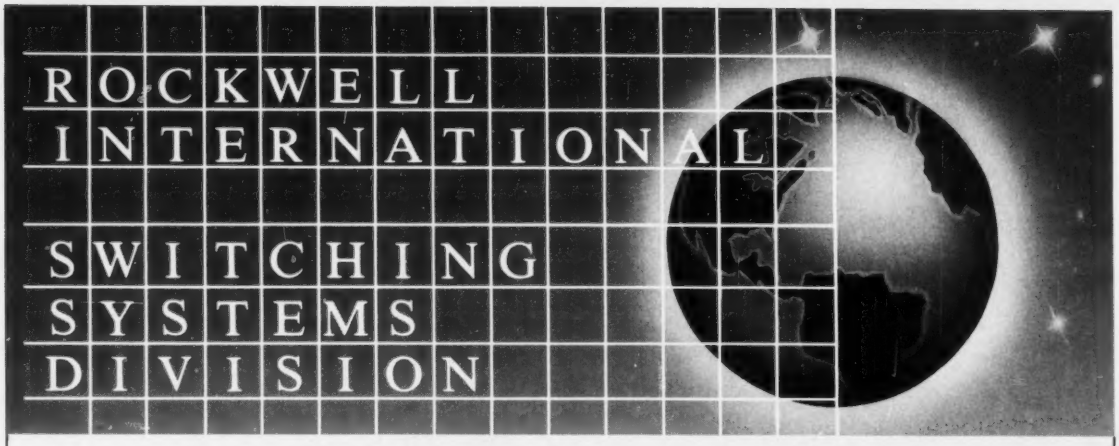

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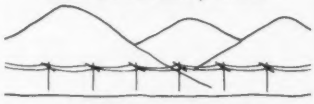

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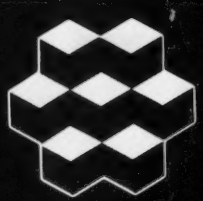

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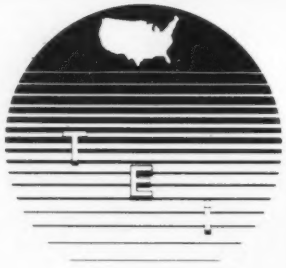

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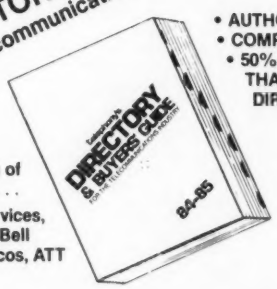

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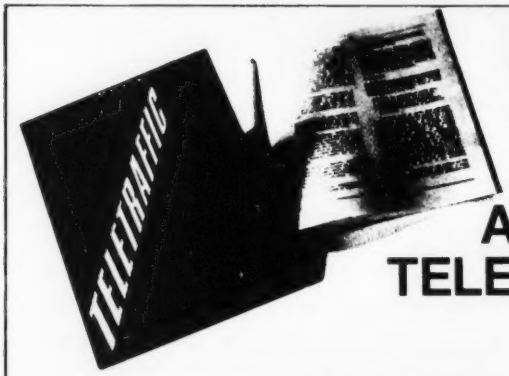

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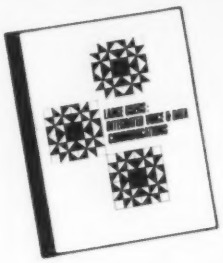

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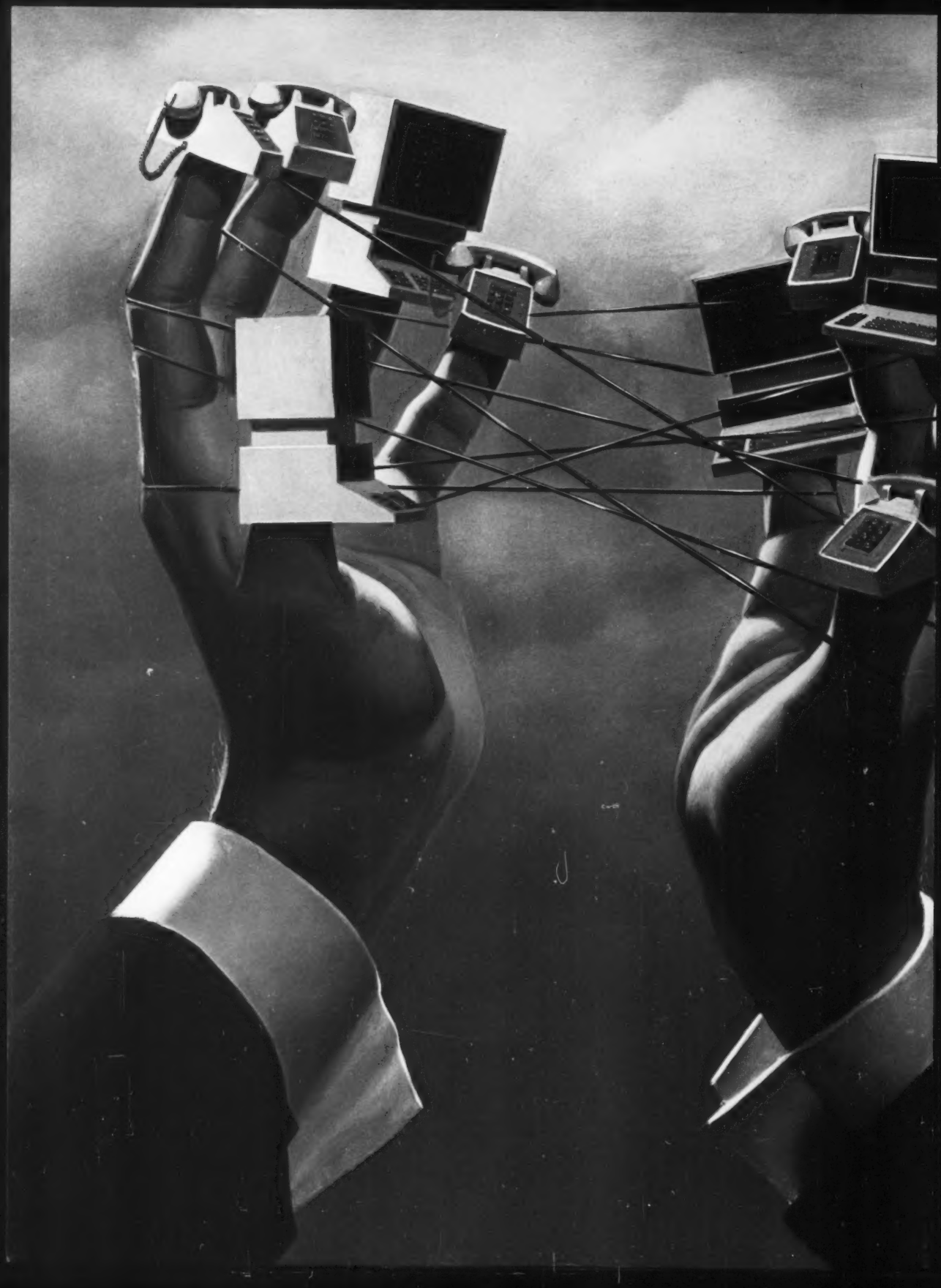

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